NOLOGY DEPARTMENT

THE PAPER INDUSTRY
and PAPER WORLD
AN EDUCATIONAL NEWS MAGAZINE—FEBRUARY, 1949

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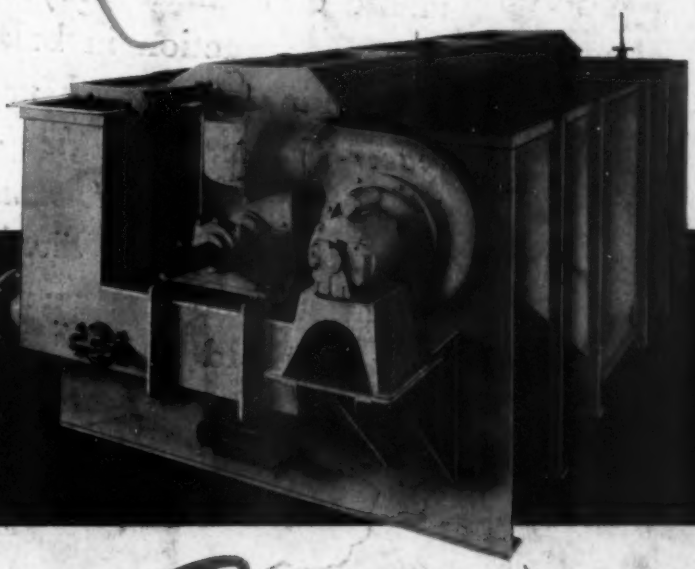
DETROIT

THICKENING by the Cheney Bigelow Air Discharge method is increasing tonnage and lowering costs for mills handling unbleached sulphite and waste paper stock.

Here's why:

The new Cheney Bigelow Air Discharge Thickener handles stock from ¼, ½ and ¾ of 1% and thickens to a desired and *controlled* consistency of from 2% to 5% or better. Just look at these five important advantages that add up to increased capacity and lower costs for many mills.

- *Capacity is increased* — sometimes doubled — because there is no couch. Air pressure removes the stock from the cylinder face, consequently it is not necessary to form a sheet that will stick to the couch before it can be discharged.
- *Consistency is controlled closely.* Stock is piped without the additional operation of adding water.
- *Cleanliness is increased.* Air pressure keeps the wire face clean. The new Cheney Bigelow rubber seal is easily loosened for simple hosing out.
- *Operation is economical.* There is less down time due to couch repairs and wire or seal changes. Operation is with one cover.
- *Installation is simple.* The unit does not require a vacuum leg, so installation can be made at any level.



Complete reports on Cheney Bigelow Air Discharge thickening of Unbleached Sulphite, Waste Paper Stock, and Groundwood are available. Write for them. Cheney Bigelow Wire Works, Springfield 7, Massachusetts.

PULP & PAPER
MILL EQUIPMENT

Cheney Bigelow
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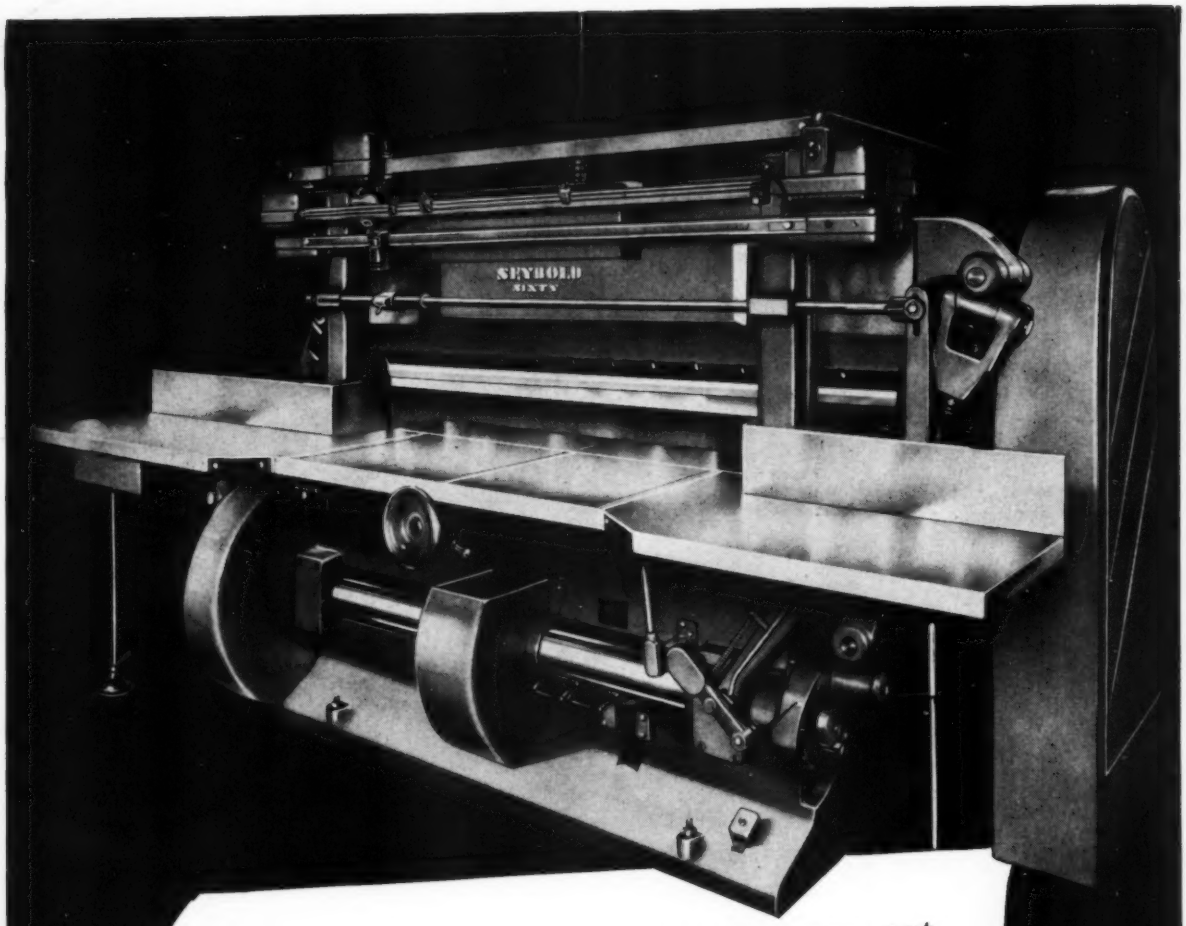

INCREASED MACHINE TONNAGE may not necessarily mean that you must increase the number of trimmers in your finishing room to keep production in balance. Some mills are learning this: *With new Seybold "Sixty" Spacer-Trimmers on the job, actually fewer trimmers are needed to handle more work! And valuable floor space is saved, too.* It will pay you to investigate production records being established by Seybold "Sixty" Mill Spacer-Trimmers.

HARRIS-SEYBOLD

General Offices—Cleveland 5, Ohio

"RIPCO MAID" . . . Rhinelander's huge new Beloit Fourdrinier machine for making glassine and grease-proof papers is seen above. Rhinelander Paper Co. blazed a trail with the "Big Swede" in 1941 and now takes another long stride forward with the ultra-modern "Ripco Maid." As designer and builder of these two machines, Beloit Iron Works knows their capabilities, and extends congratulations to the management and entire staff at Rhinelander for notable leadership and outstanding paper production.—*Beloit Iron Works, Beloit, Wisconsin.*

Birthplace of a Great Idea

In the 1860's John Huyck and his son, Francis Conkling Huyck, conducted a general store in Rensselaerville, New York. Here young Huyck found that successful storekeeping was firmly based on good service to the customer. He had imagination and initiative and he was eager to apply his talents to a more challenging enterprise. Soon the opportunity came. America's paper mills were beginning to boom, but papermakers' felts were imported from Europe. Why not make these felts right in Rensselaerville? John Huyck appraised the opportunity and encouraged his son to go ahead. So in 1870 Francis Conkling Huyck, with an associate, opened a felt mill and commenced the manufacture of papermakers' felts. That venture grew to become the firm of F.C. Huyck & Sons. Today this company strives to perpetuate the policy established by its founder—good service to the great American paper industry.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

F. C. HUYCK & SONS • *Kenwood Mills* • RENSSELAER, N. Y.

KENWOOD WOOL PRODUCTS

HUYCK *Felts*

An Important, New Booklet . . .

Here are the facts about this new, 20-page booklet on the modern way to pump corrosives . . . the Model 40 Durcopump.

- It tells what Durco alloys the pump can be built in and gives a brief description of their physical characteristics.
- It shows and explains every feature and detail of the pump's construction.
- By means of cutaway and exploded views it lets you examine every part of the design.
- It explains the convertibility of the pump from one type of corrosive to another.
- It has a chapter on accessories and modifications.
- It tells about Durco's pump testing procedure.

THE DURIRON CO., INC.
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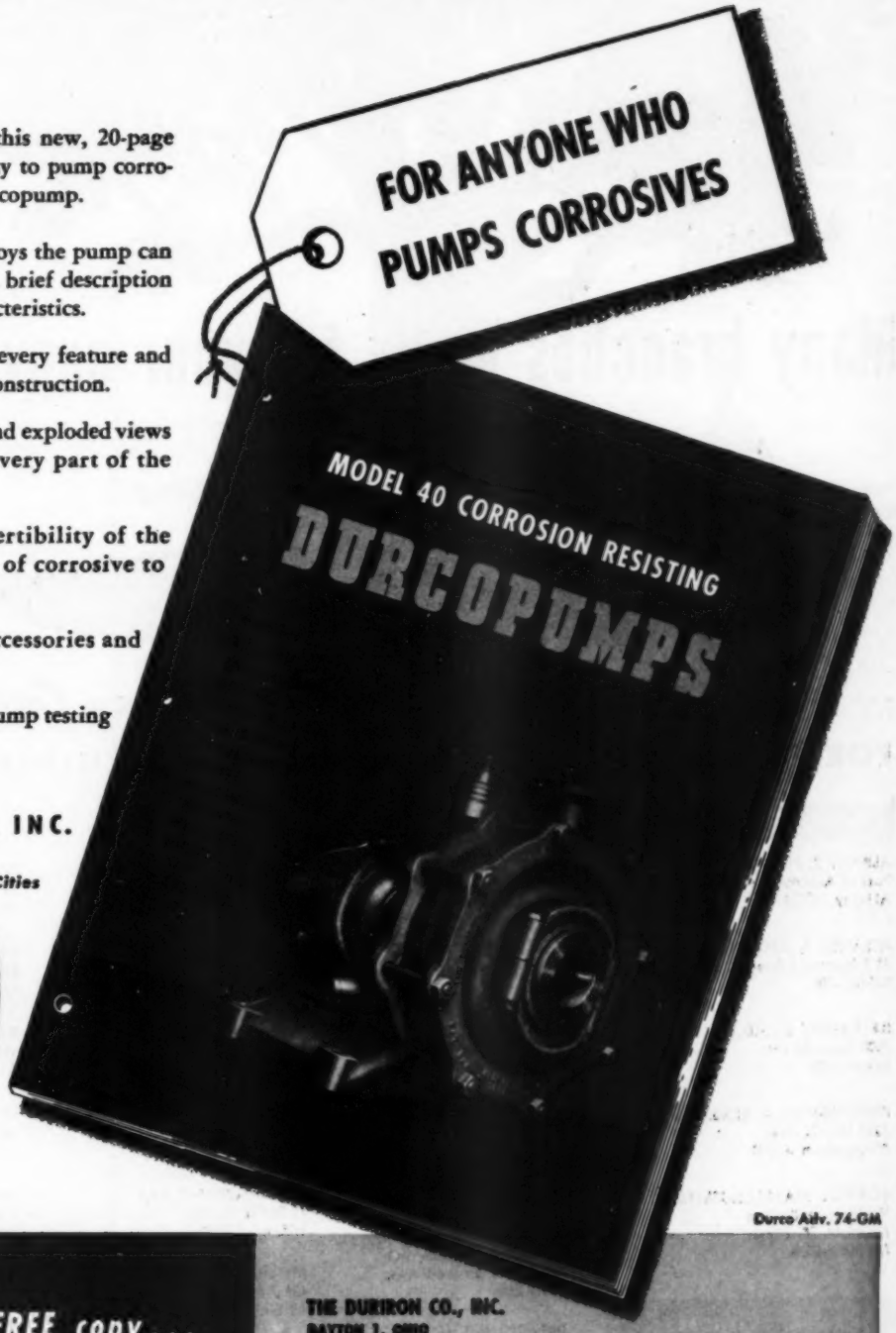
CORROSION RESISTING ALLOYS & EQUIPMENT



Durco Adv. 74-GM

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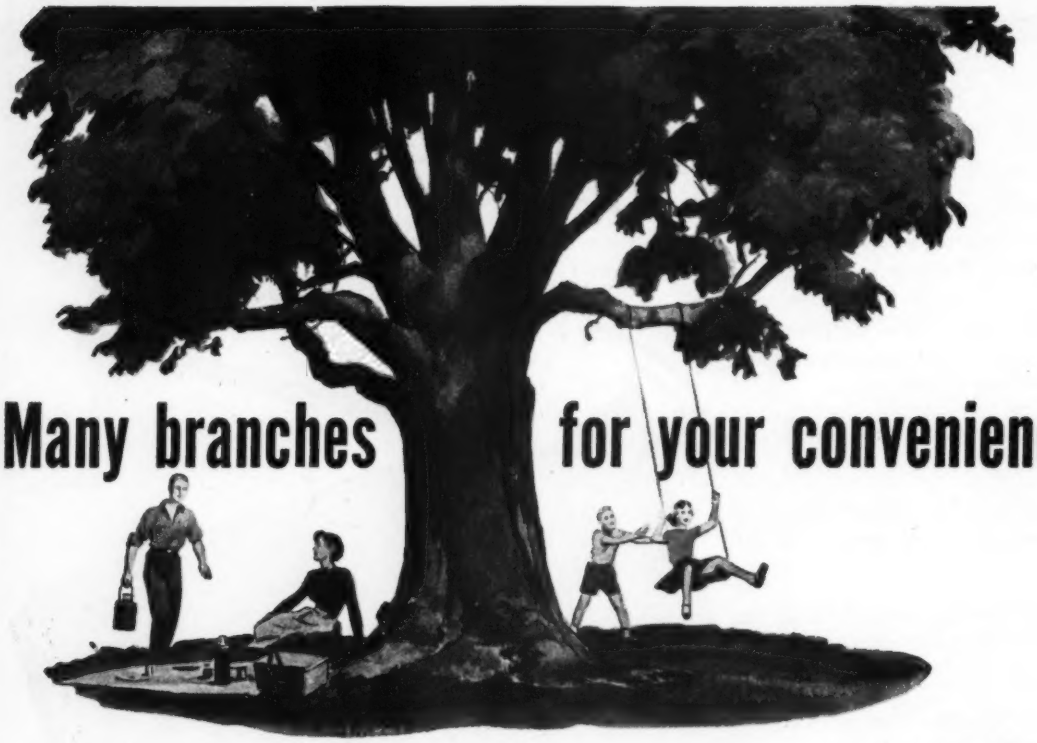

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NEW! SUPER-FLEXIBLE! SAFE!

AMAZING BWH WIRE BRAID STEAM HOSE

Here's the armored steam hose you've been looking for! It's dependably rugged, and it satisfies the most rigid safety requirements. That's because BWH technologists have spared neither time nor effort in making Concord #10 Steam Hose the best hose of its kind we've ever produced. Here are 6 reasons why this hose will serve you better:

1. The heart of the hose is the same dependably strong rubber tube that has won fame for extra service in BWH BULL DOG Steam Hose.
2. It's muscled with braids of high-tensile steel wire, resistant to heat and high pressure.
3. An open braid of asbestos next to outer wire braid assures perfect cover adhesion.
4. An entirely new method of static control is the crossed wire braiding in the asbestos section — every length tested.
5. The cover is extra tough to resist abrasion, specially designed to resist high temperatures.
6. Because no cotton duck is used, Concord #10 gives longer service on constant pressure steams.

This new hose is extra flexible, too. In fact, Concord #10 is the most modern hose you're likely to find for refineries, core drilling and other high pressure jobs.

From a safety standpoint, Concord #10 rates tops. "Flash" explosions can't happen, because little whispers of steam seep out indicating replacement is necessary. There can't be any sudden bursts to cause injuries to workmen or result in expensive shut-downs.

When you need steam hose that's lightweight, flexible, rugged and SAFE, think of BWH Concord #10. It's your best bet . . . the safest we've ever made!

☆ ☆ ☆

HAVE YOU A JOB WHERE STAMINA COUNTS? Bring us your toughest problems. We're specialists in solving them. For all industrial rubber needs, look to BWH products for dependable ruggedness, to BWH distributors for dependable service.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

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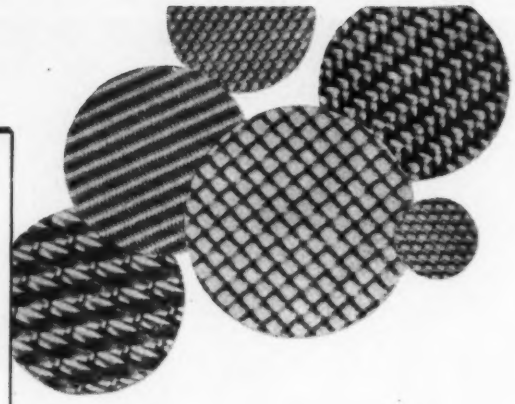

YOU know the life you are getting from your present fabric or metal cloth.

Are you satisfied; or, do you need *more* protection against corrosion...rust...wear...stress...high temperatures?

You'll find that protection in wire cloth made of Monel*, Nickel or Inconel*.

Wire cloth made of Monel, Nickel or Inconel gives you money-saving life under corrosive conditions. It resists most acids, alkalies and salts.

It has extra strength to resist damage by heavy pressures; extra hardness to resist abrasive wear; extra endurance at high temperatures; extra protection for product purity.

Yet you need not worry about cost. The easier working of these metals enables weavers to produce cloth of Monel, Nickel or Inconel at prices comparable to what you are now paying for less durable metals. *Fine weaves of Monel often cost less!*

All weaves and meshes *are available. Seams are readily brazed, soldered or welded; retain full corrosion resistance. Write Frank Bailey of Inco for booklet,* **"ESTABLISHED WEAVERS."**

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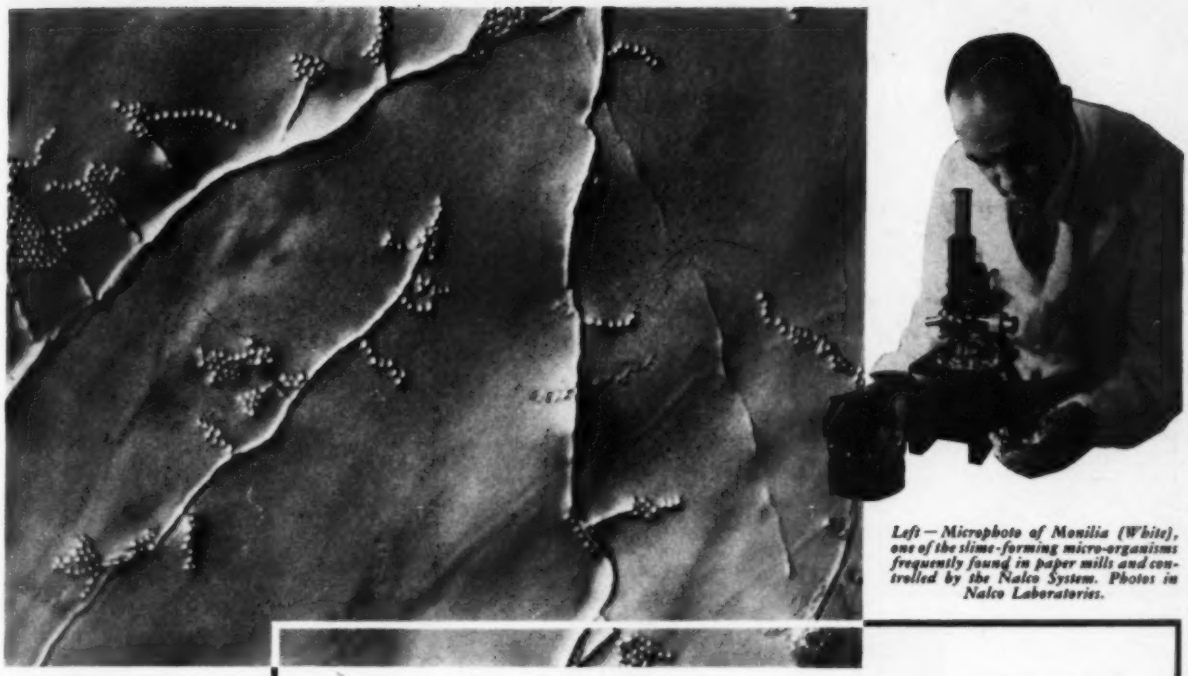

Left — Microphoto of Monilia (White), one of the slime-forming micro-organisms frequently found in paper mills and controlled by the Nalco System. Photos in Nalco Laboratories.

FORMULA FOR SUCCESSFUL SLIME CONTROL

SLIME control, like paper making itself, requires constant and careful attention to details. Here is a formula for successful slime control which will cut to a minimum, spots and specks, breaks, cleaning, and other costly problems due to slime:

- Identify slime-forming organisms to be controlled.
  A NALCO SERVICE
- Determine the best types of treatment to be used.
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- Locate, by detailed survey, the proper points of application.
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- Provide consistent supervision to check application and effectiveness of treatment.
  A NALCO SERVICE
- Maintenance of high standards of sanitation throughout the mill. (Even the best of treating and scientific control can be seriously hampered by unsanitary conditions.)

Nalco Field Representatives and the modern, scientific facilities of the Nalco Laboratories are at your service to put this formula for successful slime control into practical operation in your mill. Write for details today.

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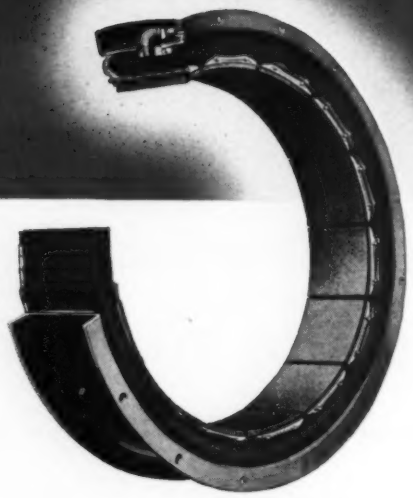
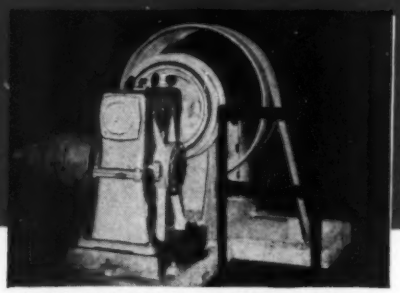
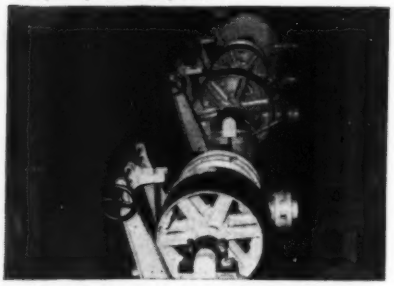


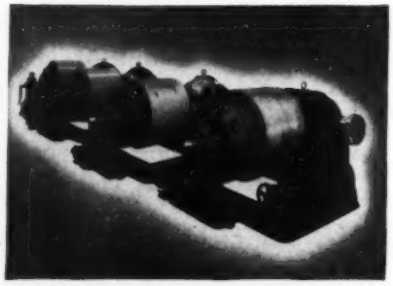
Fawick Airflex Clutch or Brake Type CB



Fawick Airflex Clutch on Calender Drive of No. 2 paper machine at Howard Smith Paper Co., Ltd., Cornwall, Ont.



Fawick Airflex Clutches on 3 press drives of No. 2 paper machine at Howard Smith Paper Co., Ltd., Cornwall, Ont.



Fawick Airflex Clutches supplied on Black Clawson dryer section drives.

The rubber-and-fabric pneumatic tube faced with friction shoe assemblies is the only moving part in this Fawick Clutch. This part naturally stays in perfect adjustment at all times—automatically compensating for wear of the friction shoes.

Job-tested, Fawick Clutches meet the toughest operating conditions in many fields—petroleum, earth-moving, metalworking, rubber, paper, pulp and others.

Write our engineering department for a recommendation of the Fawick elements best suited for your machines. Address Dept. PI.

FAWICK Airflex CO., INC.

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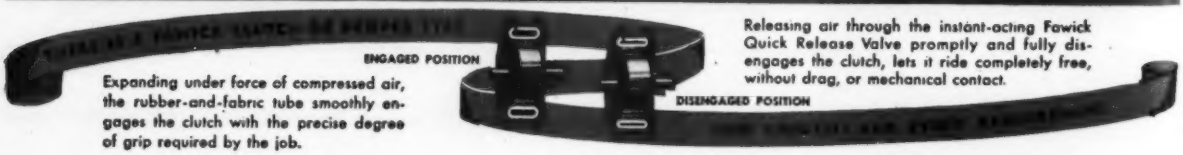

Expanding under force of compressed air, the rubber-and-fabric tube smoothly engages the clutch with the precise degree of grip required by the job.

Releasing air through the instant-acting Fawick Quick Release Valve promptly and fully disengages the clutch, lets it ride completely free, without drag, or mechanical contact.

Who can foretell... the far-reaching benefits new Oakite cleaning methods will bring to the paper industry tomorrow?

Paper making is an old industry. So old, in fact, that the 40 years past seem insignificant, indeed. But in those four decades paper tonnage has almost doubled in meeting the demands of our educational, communication and distribution systems. And each year has seen notable advances in the techniques of paper making in all its wide varieties.

Keeping pace with these advances have been the technical developments in Oakite materials and methods that today are contributing greatly in solving the industry's specialized cleaning problems. From safely restoring the soft, absorbent texture of paper-carrying felts to thoroughly removing slime and other deposits from Fourdrinier wires, screen plates, save-alls . . . modern Oakite cleaning materials and methods have been adopted by more and more mills as standard practice for this work.

This month, while Oakite is commemorating its 40th birthday, it is expectantly looking ahead . . . planning for new opportunities of service to paper and pulp mills . . . developing new Oakite methods and materials to provide still further economies in the maintenance of paper-making equipment. Oakite Products, Inc., 21A Thames St., New York 6, N. Y.

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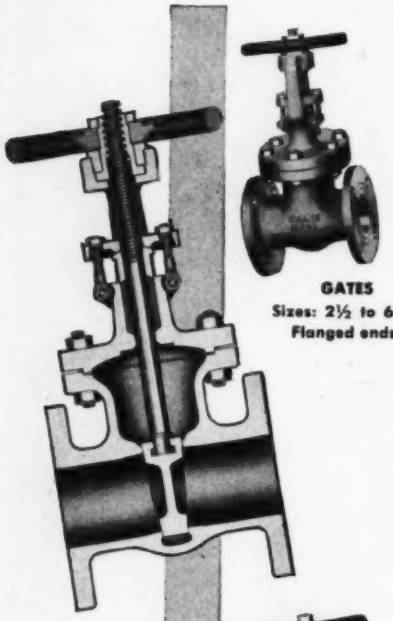
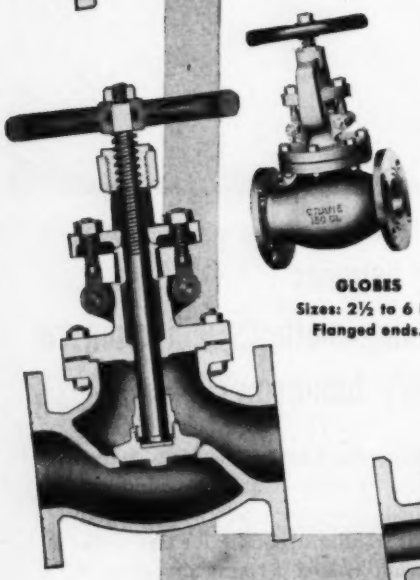
INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

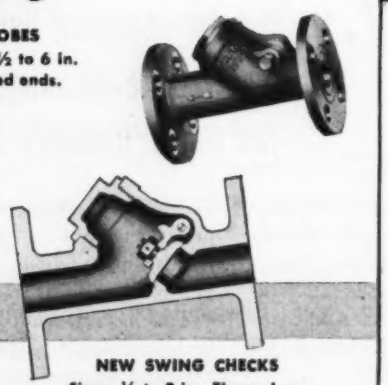
See these new CRANE Corrosion-resistant valves



GATES
Sizes: 2½ to 6 in.
Flanged ends.



GLOBES
Sizes: 2½ to 6 in.
Flanged ends.



NEW SWING CHECKS
Sizes: ½ to 2 in. Flanged or screwed ends.
Also straightway flow pattern in sizes 2½ to 6 in.

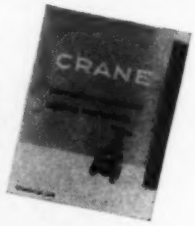
GATES, GLOBES and CHECKS in 18-8 Mo and Monel

Working Pressure: 150 pounds, liquid or gas

Available in either all 18-8 Mo or all Monel, these new valves are Crane Co.'s most advanced contribution toward better control of processing fluids.

In developing these valves, Crane engineers have overlooked nothing—in materials or mechanical design—that would assure the most positive performance, economical operation, and ease of maintenance. Rugged construction provides greater safety for the operator and contributes substantially to longer valve life, even under severe corrosive conditions.

Take your choice of materials. All parts in contact with flow are either Crane Quality 18-8 Mo or Monel—materials produced under the most rigid control. See these valves—the best buy in their class—at your local Crane Branch, or **ask for Catalog No. 320,** describing Crane corrosion-resistant piping materials.



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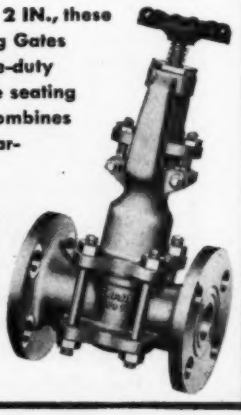
IN SIZES ½ to 2 IN., these new Crane Plug Gates serve as double-duty valves. Unique seating development combines best service characteristics of conventional gate and globe valves. Ideal for process and chemical industries.



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FOR EVERY PIPING SYSTEM

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the

TREND

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to

AUTOMATIC

EMULSIFYING

A significant advance in rosin size technology is the development of the new Hercules Automatic Emulsifying Process.* Completely automatic, it converts Hercules Paste Rosin Size into a dilute emulsion. The new process saves considerable labor, eliminates the necessity for large storage tanks, requires a minimum of space. Easy to install, it also permits the use of certain types of sizes which could not previously be used because of inadequate emulsion stability. Many mills are adapting this process to their papermaking economy. Write for our new booklet.

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SIZING MATERIALS AND OTHER CHEMICALS FOR PAPER

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JONES DRIVES

for the Paper Industry

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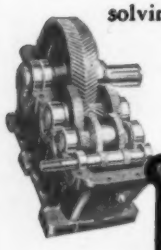
You will find Jones Speed Reducers and transmission products on important drives in paper mills in every section of the country. For nearly a half century the Jones organization has been working with the manufacturers of paper making machinery and with engineers in the paper industry, on a wide variety of drive problems.

As a result of these years of experience, the Jones organization has collected a vast amount of technical data relating to drives in the paper industry. This information is available either in the form of catalogs or in our files. You are cordially invited to make use of any of this material, or our services, in any way you feel might be helpful in solving your drive problems.

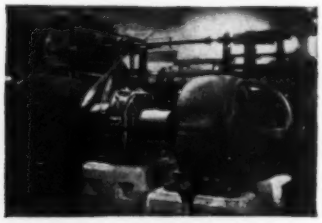


W. A. JONES FOUNDRY & MACHINE CO.
4439 Roosevelt Road, Chicago 24, Illinois

Jones

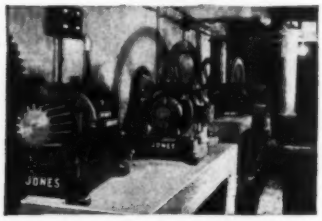
HERRINGBONE — WORM — SPUR — GEAR SPEED REDUCERS • PULLEYS • GEARS • V-BELT SHEAVES • ANTI-FRICTION PILLOW BLOCKS • FRICTION CLUTCHES • FLEXIBLE COUPLINGS

Jones herringbone speed reducer on a straw washer in a paper mill.

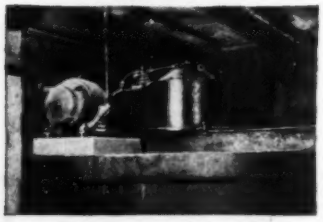


Wet end of sectional paper mill driven through a Jones herringbone speed reducer.

Vertical agitator in paper mill driven through a Jones herringbone speed reducer.



Group of agitator drives in a paper mill driven by Jones herringbone speed reducers.



Jones worm-helical speed reducer on a pulp tank drive.

Paper mill agitator driven with a Jones worm-helical speed reducer.

On the Way...

TO OUTSTANDING PULP DIGESTER SERVICE

Posey Stainless Clad Pulp Digester...
13′ O. D. x 40′ long...
en route to leading paper manufacturer.

Consult Posey Iron Works about your requirements—and you're on the way to obtaining outstanding pulp digester service. Posey digesters are fabricated from alloys that provide high resistance to black liquor and other corrosives. Posey "know-how" and engineering skill reduce maintenance . . . often point the way to savings in equipment cost. Weld is stable and digesters are properly stress-relieved throughout. Write today and describe your service conditions. No obligation.

POSEY IRON WORKS, INC.
formerly **LANCASTER IRON WORKS, INC.**
LANCASTER, PENNA., U. S. A.
Digesters for:
EXPERIMENTAL WORK **SULPHATE**
SODA **SULPHITE**

Shown here is one view in the spotless modern plant where Swift's Animal Protein Colloid is made. Operation is continuous, automatic... the product is "untouched by human hands," not contaminated by foreign substances.

Investigate this Modern Process Agent:

Swift's Animal Protein Colloid*

(made from an exclusive Swift Process)

Does your manufacturing process require . . .

1. An emulsifier?
2. A flotation agent?
3. A gel structure?
4. A settling agent?
5. A protective coating?
6. A sizing agent?
7. A carrier of pigments?
8. An impregnating agent?
9. A base for pigment?
10. An oilproofing agent?
11. A flocculating agent?
12. A clarifying agent?
13. A filtering agent?
14. A stiffening agent?
15. A mordant?

This modern process agent, Swift's refined Animal Protein Colloid, has properties which may be employed in a wide number of processes. Even though you have used other processing agents, be sure you investigate Swift's Animal Protein Colloid now. It has unusual properties. It may meet the requirements of your present operations or help in developing new ones.

What is this modern process agent?

Swift's Animal Protein Colloid is made by an exclusive Swift process. Protein liquor is extracted from bones and highly concentrated. This pure liquid falls on a bed of dry finished product which adheres evenly to the droplets. Then, by continuous and automatic schedule, these droplets travel through driers and are milled and screened. This whole operation is under *precise synchronized control* and is completed in relatively short time.

The result is a uniform granular form that goes into solution rapidly. It's a purified product, light amber in color.

Because plant and machinery are kept spotlessly clean — the finished product does not touch material which can contaminate it with foreign substances... because of the precise control possible with Swift's exclusive process, Swift can bring you this *superior* processing agent. And Swift's Animal Protein Colloid has the same high quality and uniform characteristics the year 'round.

Swift's technical service yours, investigate now

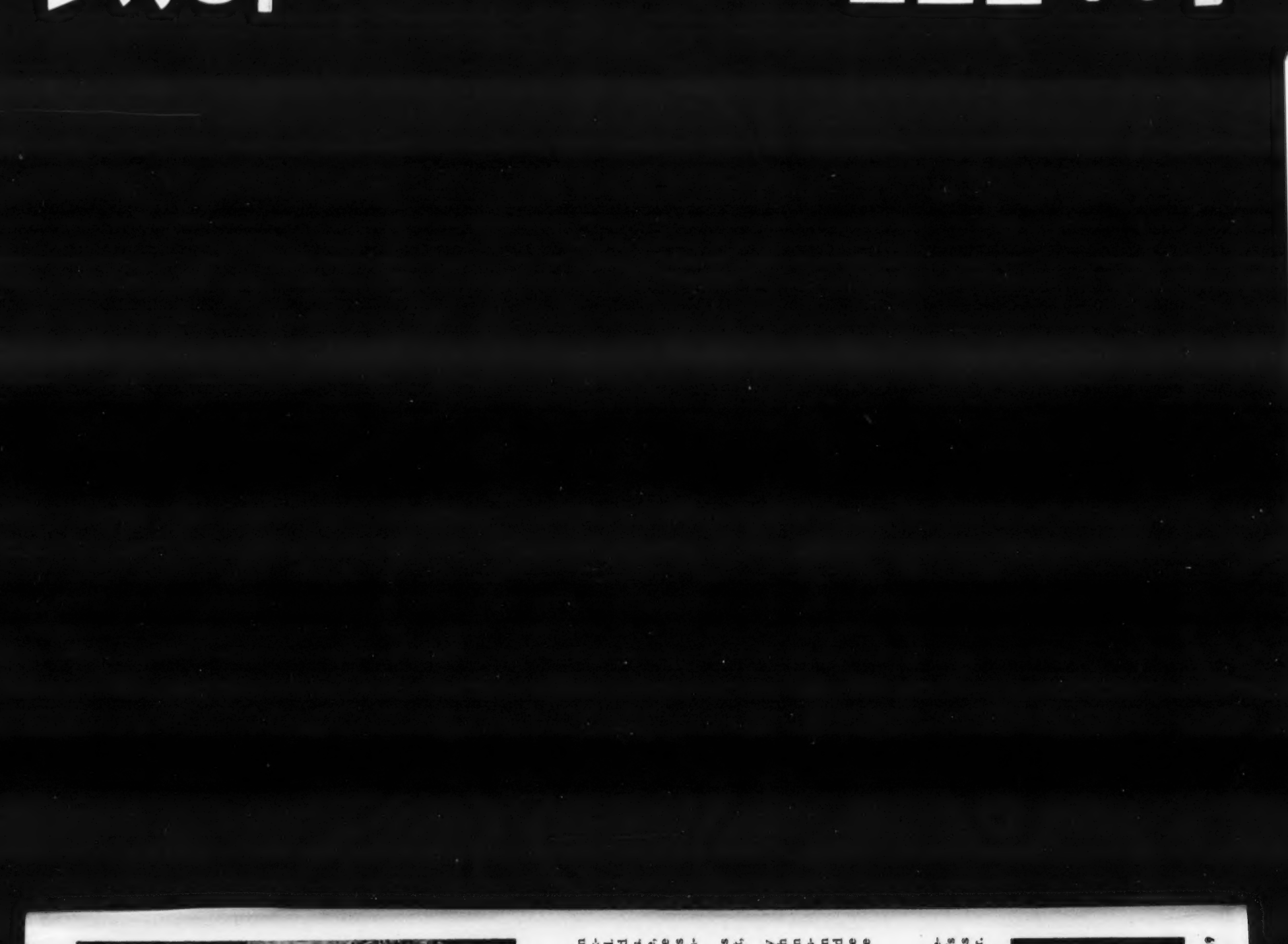
Write or phone for one of Swift's special representatives. He will call and discuss Swift's Animal Protein Colloid with you. This process agent may be just what you are looking for. Write to:

Swift & Company

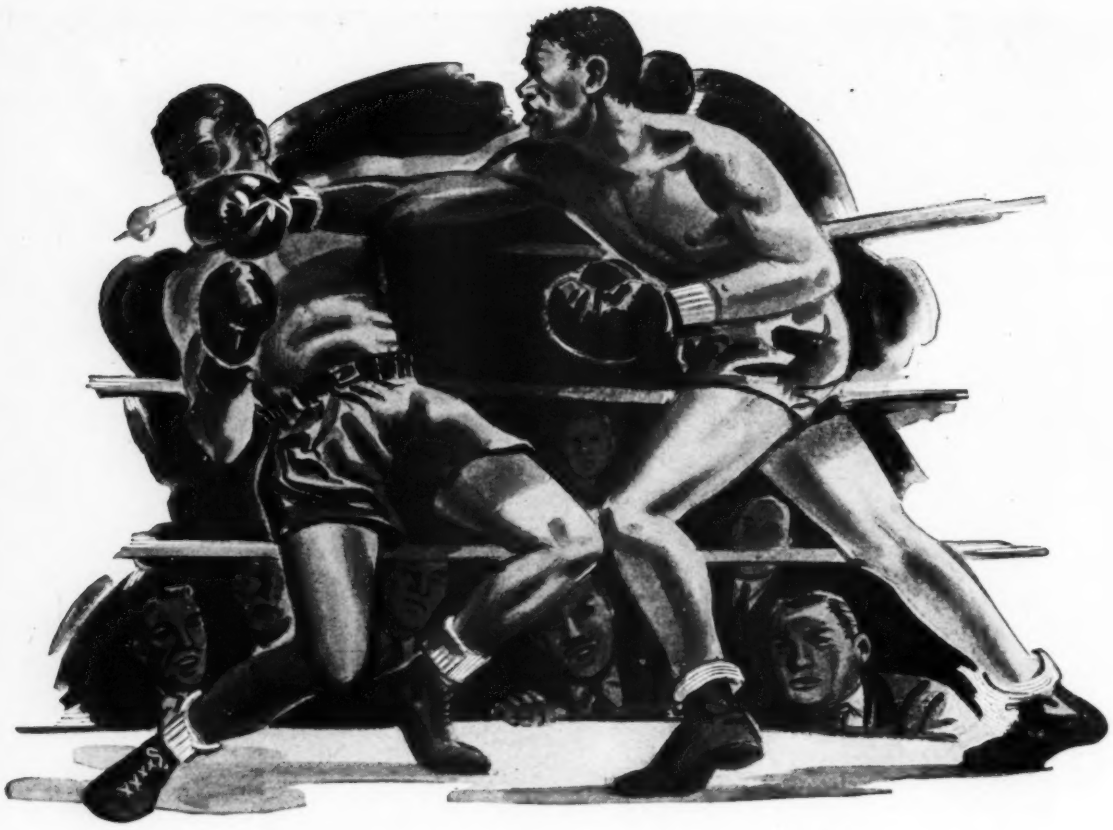
ADHESIVE PRODUCTS DEPARTMENT

4123 Packers Avenue, Chicago 9, Illinois

**Commercially high quality bone glue.*



MORE
Rapid
DRAINAGE
provided by
SUTHERLANDS
Increased Tonnage, Improved Quality and Reduced Cost per Ton of paper all result from the better, more rapid drainage of stock, properly refined by Sutherlands. All are "musts" for profitable mill operation today, but better quality results from stock properly prepared at a high drainage rate. More rapid drainage is provided by Sutherlands, plus additional refining output, without using any more power or floor space than you are now using. Give a few moments' thought to what all this can mean in your mill, then ask for our recommendations.
SUTHERLAND
REFINER CORPORATION
TRENTON, NEW JERSEY—Manufactured in the United States by Valley Iron Works Co., Appleton, Wisconsin
Sutherland Refiner Ltd., Windsor Hotel, Montreal, P. Q.



FAST WORK!

It took the champion ten rounds to put the squeeze on the challenger — ten seconds to finish him . . .

To make paper or board your machine must combine plenty of squeeze at the presses with high speed at the drier rolls. This is where Hamilton Felts prove themselves champions!

Equip your machines with Hamilton Felts. Speed them up. Your sheets will be dried before the bell rings.

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Miami Woolen Mills

Hamilton Felts

Established 1858

50% MORE LIQUID
33% LESS POWER

User Reports: *Previous* displacement pump required 15 hp motor for 100 gpm capacity at 110 ft head. *Now* Allis-Chalmers SS Unit Pump with only 10 hp motor delivers 150 gpm at same head!

IN ADDITION, this same user reports savings in space and maintenance.

Paper, Petroleum, Mining, Chemical — in *any* industry, Allis-Chalmers SS Unit Pumps can be used for circulating, gathering, water supply, drainage, etc.

Check these 4 features: —

Deliver Rated Efficiencies — Every unit tested at the factory and the performance curve plotted. Efficiency is proved.

Heavy Construction — Compare section thicknesses, shaft diameters and other features. See why SS Unit Pumps run years without repairs.

Easy Maintenance — Compact design and few parts reduce maintenance. Bronze ring protects casing from wear. Is easily replaced when required.

Application Engineering — When a pump is recommended by an A-C Pump Application Engineer, you know that you are getting the pump that fits your needs exactly and that will give you dependable service at low cost per gallon.

SS Unit is one of many Allis-Chalmers models for most industrial pumping services. For information, see your Allis-Chalmers Authorized Dealer or District Office. Or write for Bulletin 52B6059E. Also listed in Sweet's. A 2603

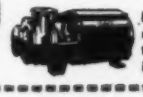
SS Unit, Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and District Offices throughout the country.

MOTORS — ½ to 25,000 HP and up. Matching Allis-Chalmers Control.

TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.



PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

ALLIS-CHALMERS, 991A SO. 70 ST.
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ALLIS-CHALMERS

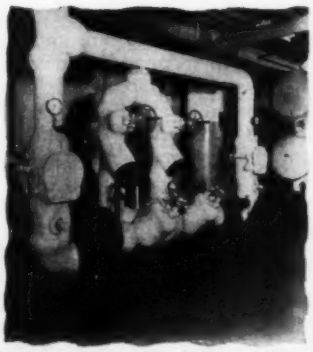
LUNKENHEIMER VALVES Meet High Standards in Abbott Laboratories!

Lunkenheimer Valves in the process lines at the fermenters used in the production of penicillin and streptomycin.

NOTED PHARMACEUTICAL MANUFACTURER SPECIFIES LUNKENHEIMER VALVES FOR PROCESS LINES IN ITS MODERN NORTH CHICAGO PLANT

In the manufacture of the wonder drugs, penicillin and streptomycin, it's small wonder that Lunkenheimer Valves are included with other items of the finest-obtainable processing equipment. Intermediate compounds in the ratio of approximately five thousand units to one of finished product are flow-controlled by hundreds of Lunkenheimer Valves.

For dependability over long periods of service, these valves at Abbott Laboratories illustrate the way all phases of industry and commerce rely on Lunkenheimer Valves. This same low-cost service can be a profit factor in your operations.



Lunkenheimer Valves in refrigeration lines used to control temperature of fermenters.

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THE LUNKENHEIMER CO.

"QUALITY"

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NEW YORK 13 CHICAGO 6

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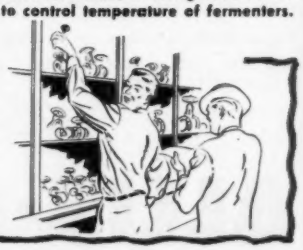
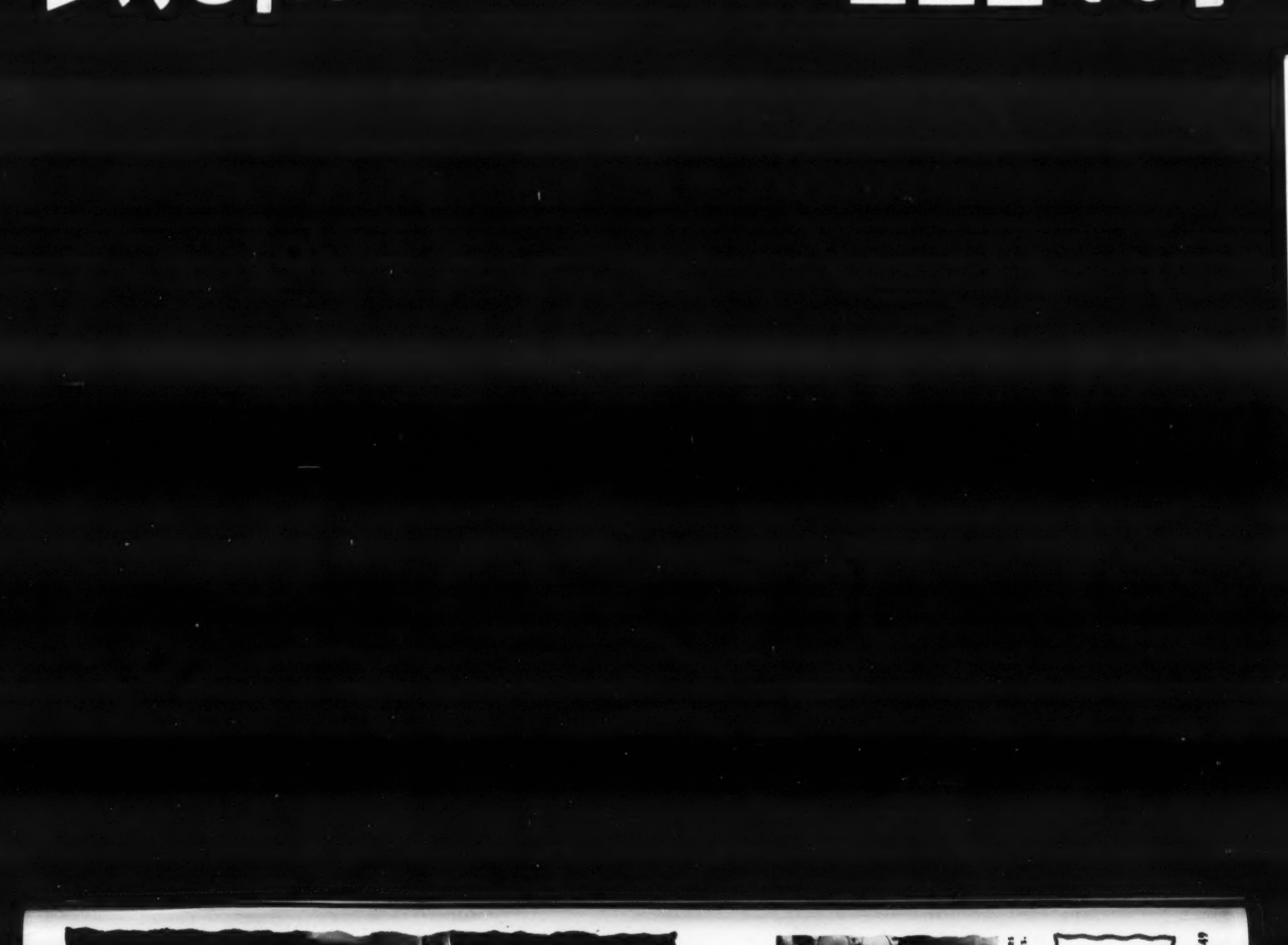
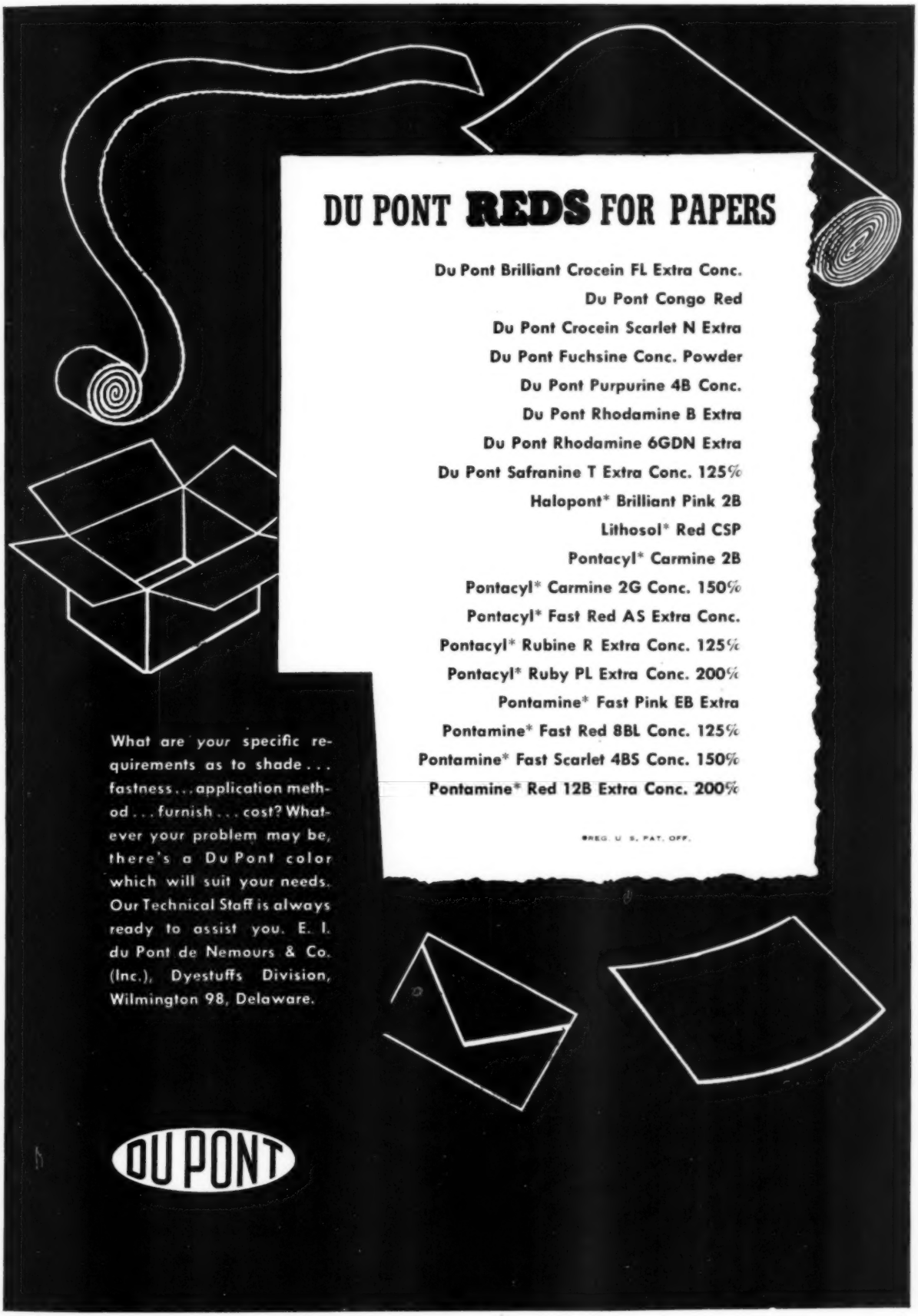
WHETHER YOU'RE PLANNING a new plant, expansion of present facilities or modernization . . . you can specify Lunkenheimer Valves with utmost confidence. Available through Distributors in all industrial centers.






DU PONT REDS FOR PAPERS
Du Pont Brilliant Crocein FL Extra Conc.
Du Pont Congo Red
Du Pont Crocein Scarlet N Extra
Du Pont Fuchsine Conc. Powder
Du Pont Purpurine 4B Conc.
Du Pont Rhodamine B Extra
Du Pont Rhodamine 6GDN Extra
Du Pont Safranine T Extra Conc. 125%
Halopont* Brilliant Pink 2B
Lithosol* Red CSP
Pontacyl* Carmine 2B
Pontacyl* Carmine 2G Conc. 150%
Pontacyl* Fast Red AS Extra Conc.
Pontacyl* Rubine R Extra Conc. 125%
Pontacyl* Ruby PL Extra Conc. 200%
Pontamine* Fast Pink EB Extra
Pontamine* Fast Red 8BL Conc. 125%
Pontamine* Fast Scarlet 4BS Conc. 150%
Pontamine* Red 12B Extra Conc. 200%
*REG. U. S. PAT. OFF.
What are your specific requirements as to shade . . . fastness . . . application method . . . furnish . . . cost? Whatever your problem may be, there's a Du Pont color which will suit your needs. Our Technical Staff is always ready to assist you. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.
DU PONT

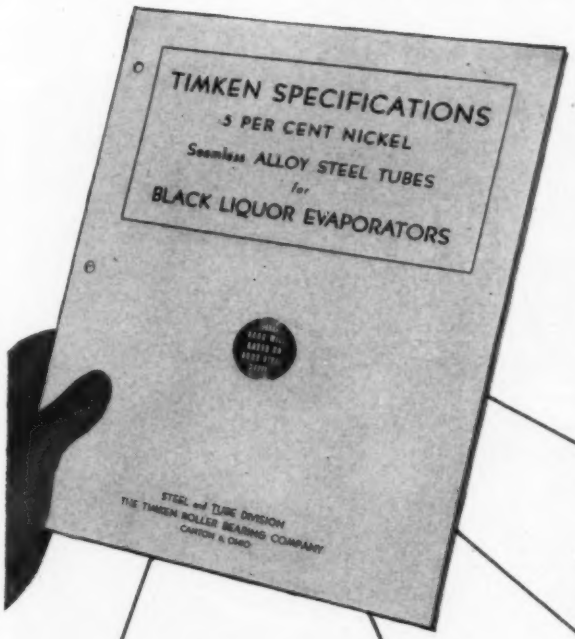
Delivers the same physical characteristics to your finished sheets... day after day

Uniformity in stock preparation, day after day or at any future time, is accomplished with the JONES-BERTRAMS PATENT BEATER. Designed to provide uniformity of fibre treatment in each batch, it produces the closely controlled characteristics desired in the finished sheet. For duplication of results, at any time, it assures the same degree of Mullen, tear, fold, porosity, surface and other required characteristics to your paper product.

JONES-BERTRAMS PATENT BEATER
(Stainless Steel)

Jones
E. D. JONES & SONS COMPANY-PITTSFIELD, MASS.
Builders of Quality Machinery for Paper Mills
MANUFACTURERS AND DISTRIBUTORS IN CANADA: WATEROUS LTD., BRANTFORD, ONT.

How to know what you're getting when you buy black liquor evaporator tubes

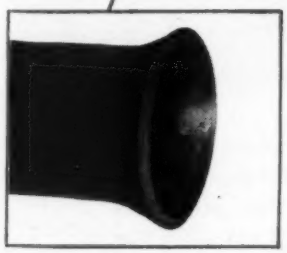


WITH the Timken® 5% nickel tube specifications, there's no guesswork when you buy tubes for black liquor evaporator service. We show you what you get and *guarantee* you'll get it!

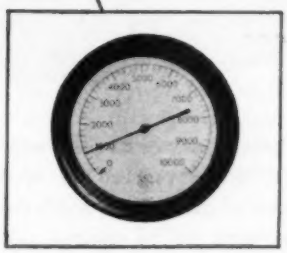
Chemical composition, physical properties, tolerances, inspection methods, and other essential points are covered in the Timken specifications for 5% nickel tubes. Shown below are 4 typical examples.

Because Timken 5% nickel tubes are guaranteed to meet every one of these specifications, they give you maximum tube life per dollar invested. Through using Timken tubing made to these specifications, leading pulp mill operators for years have been able to cut the cost of black liquor corrosion by reducing downtime, lowering tube replacement costs, and minimizing tube sheet wear.

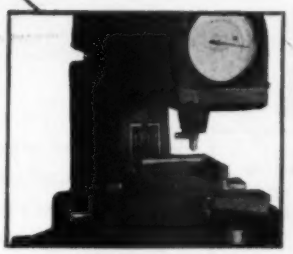
We'll be glad to send you a copy of Timken specifications for 5% nickel tubes, without charge or obligation. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".



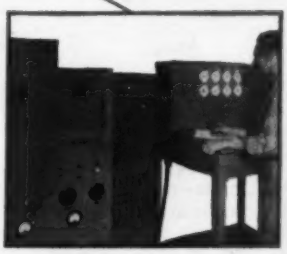
1 NO CRACKS OR FLAWS. Tube sections must withstand expansion to 20% increased I.D. without showing flaws or cracking.



2 PRESSURE TESTED. Each tube must withstand hydrostatic pressure test of 1000 pounds per square inch before shipment.



3 CONTROLLED HARDNESS. Rockwell hardness test on a specimen cut from the tube must indicate a hardness number not exceeding B 89.

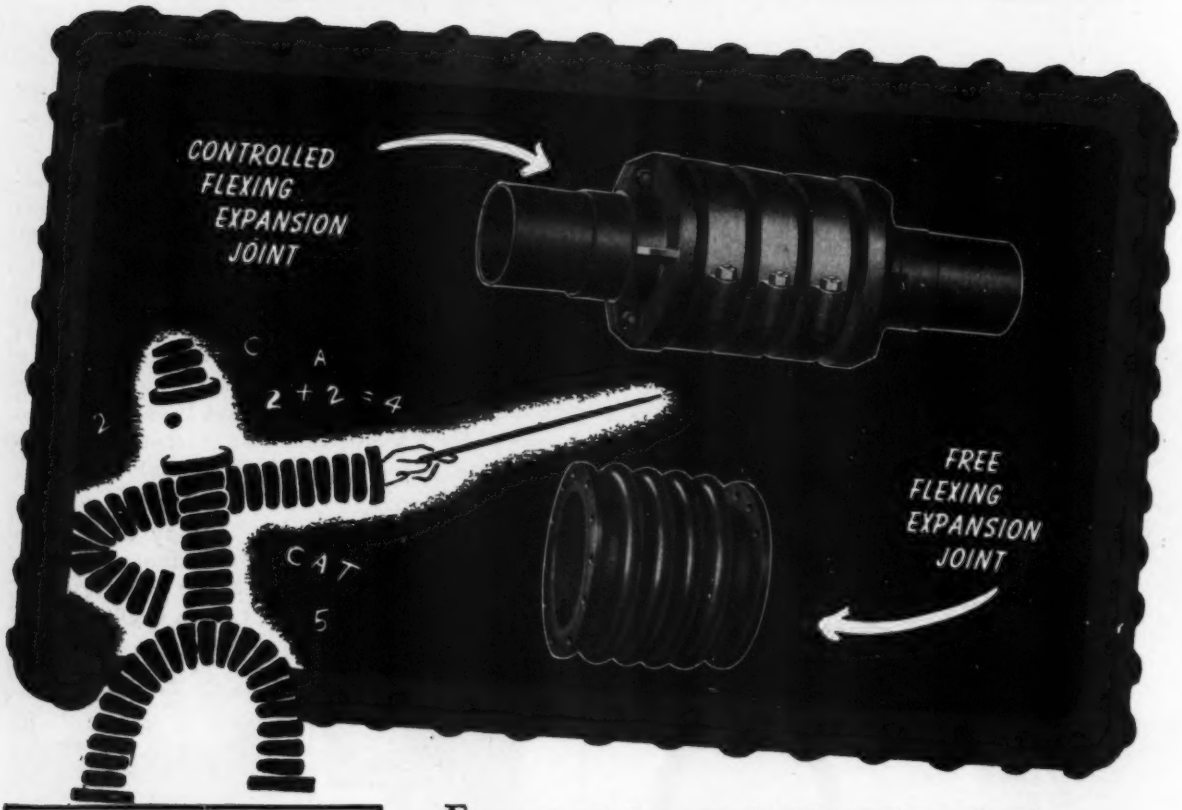


4 CHEMICAL COMPOSITION must be as follows: C—.15 Max., Mn—.50 Max., P—.040 Max., S—.040 Max., Si—.10 Min., Ni —4.74—5.25.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing

Let CMH simplify expansion control for you



CMH FREE-FLEXING EXPANSION JOINTS for pressures to 30 psi.; temperatures to 1400° F. Sizes to 24" I.D. Flanged or welding ends.

CMH CONTROLLED-FLEXING EXPANSION JOINTS with precision mated control rings for pressures to 300 psi.; temperatures to 1400° F. Sizes to 24" I.D. Flanged or welding ends.

SPECIAL CMH EXPANSION JOINTS for higher pressures can be furnished. Recommendations will be made on receipt of installation details.

For most installations, expansion joint selection need not be a complicated task. CMH has reduced the expansion joint selection problem to a matter of charts from which the joints necessary to meet your requirements may be selected quickly and easily. For unusual installations CMH offers its "Engineered Application Service" in which competent piping specialists will analyze your problems and make recommendations.

Whether your requirements are "run of the mine" or "one in a million" . . . for a new installation or replacement of obsolete equipment . . . CMH will make it easier for you to get the *right* expansion joint.

"FLEXON" identifies CMH products, which have served industry for more than 45 years.

"the science of FLEXONICS . . . "the controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration and corrosion" . . . is exemplified in the basic products of Chicago Metal Hose Corporation.

The charts mentioned above plus additional application data are presented in Bulletin EJ-47A. Write for copy.

CMH EXPANSION JOINTS

CHICAGO METAL HOSE CORPORATION

Expansion Joint Division • Maywood, Illinois

Plants at Maywood, Elgin and Rock Falls, Illinois

In Canada: Canadian Metal Hose Company, Ltd., Brampton, Ontario

MOBILE HYDROCRANE Puts Zip Into Light Logging, Pulp Wood Handling

Loads Are Handled Safely, easily with the Hydrocrane's Hydraulic grapple.

MOVE your "loading platform" from place to place at normal truck speeds . . . take advantage of Hydrocrane mobility to handle more logs per day . . . cut hauling costs by keeping your loading time down, your trucks on the move.

This light-weight, all-hydraulic truck crane moves about easily — yet, with the firm support provided by the hydraulic outriggers, it handles bigger loads at a longer radius than heavier conventional cranes. Outriggers extend or retract in seconds — are adjustable individually to level up the crane on uneven ground. Accurate hydraulic control of boom lift, load lift, swing, and boom-telescoping simplifies picking up and spotting the load. The positive-acting hydraulic grapple quickly clutches single logs, pulp wood, or paper bales. Maintenance costs are less with a Hydrocrane. Hundreds of wearing parts are eliminated — no clutches, brakes, drums, gear trains. Your distributor will be glad to tell you why this unit profitably handles pulpwood jobs no other equipment can touch. See him now or send coupon.

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Please send me additional information on the Hydrocrane.

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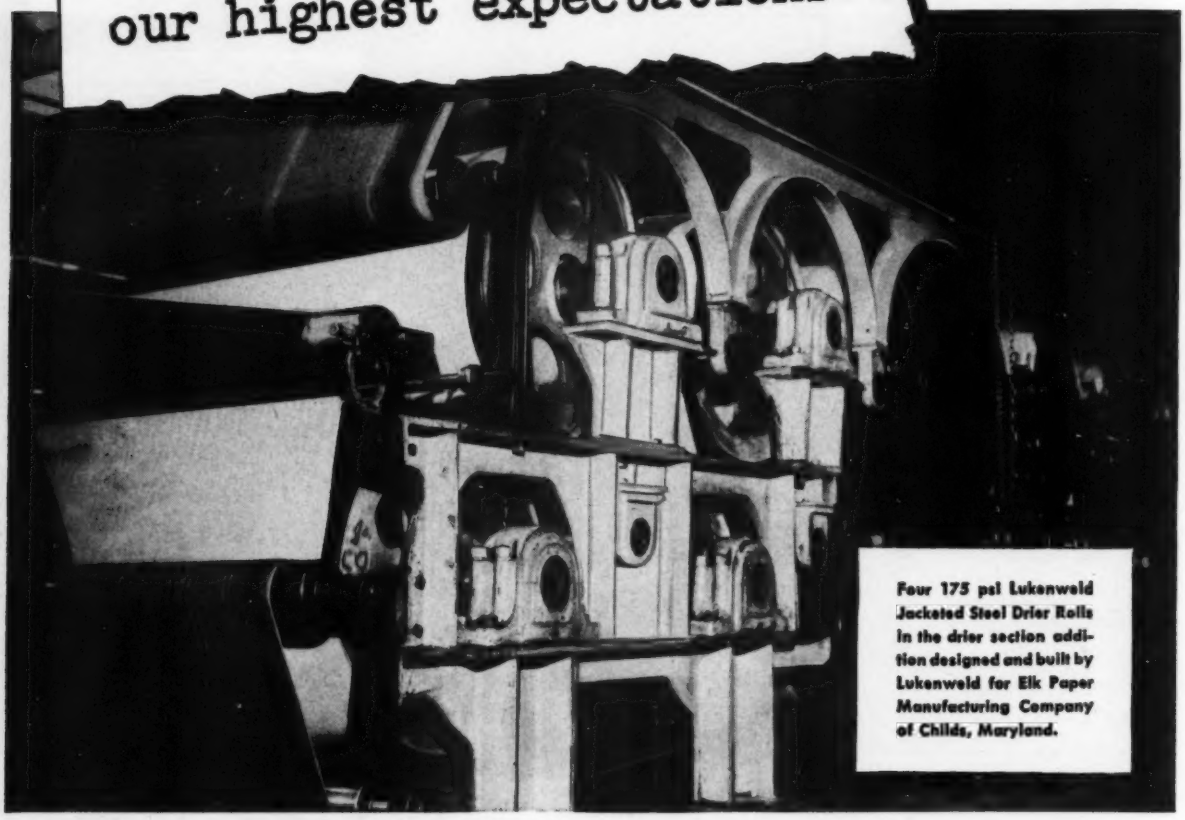
13H48

"production has exceeded our highest expectations"



Four 175 psi Lukenweld Jacketed Steel Drier Rolls in the drier section addition designed and built by Lukenweld for Elk Paper Manufacturing Company of Childs, Maryland.

...with this Lukenweld drier section addition

Co-operation between operating men with drying problems and Lukenweld engineers brings in frequent reports like this one from Elk Paper—increased output, higher quality production, safer operation.

As designers and manufacturers of complete drying machinery, we at Lukenweld are well acquainted with drying operations in many industries. We'll take your ideas and put them to work—first a design on paper, then a pilot model if desirable, a finished machine or structure, and its installation. Lukenweld service is that complete.

If the job calls for Drier Rolls... Hundreds of Lukenweld Jacketed Steel Drier Rolls, in service today in the paper, chemical, drug, food, plastic and other industries, are proving they'll do the job faster, better and safer. *Faster* because of reduced wall thickness and positive scavenging of entrapped air, condensate and film from steam passages, assuring higher efficiency. *Better* because surface temperatures are even and constant. *Safer* because of their high-strength, steel plate construction.

For drying help, or for Bulletin 358 telling about Lukenweld Drier Rolls, write Lukenweld, Division of Lukens Steel Company, 408 Lukens Building, Coatesville, Pennsylvania.

We'll lend you "LUKENWELD", a 16mm motion picture with sound, highlighting our methods, facilities and products. Running time: 20 minutes. Write for booking date.

LUKENS
LUKENWELD DIVISION

DESIGNERS, ENGINEERS AND MANUFACTURERS OF MACHINERY

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THE THERMOMETER *with Degrees* from the School of Practical Experience

ACTUAL experience, in thousands of plants and operations, has proven that the Brown Thermometer can be relied upon for continuous and satisfactory service. Accurate temperature measurement and control, permanent record, greater power, speedy response . . . these are the popular features which have helped the Brown Thermometer remain first choice with practical production men year after year!

Investigate Brown Thermometers . . . indicating, recording, controlling . . . for *your* temperature problems. Control may be electric or pneumatic . . . in all forms. The bulb may be located at any distance up to 200 feet from the instrument.

It will pay *you* to specify Brown Thermometers . . . proved by practical experience . . . in your plant.

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Write, today, for your copy of Catalog 6708 . . . for complete information on Brown Thermometers. No obligation.

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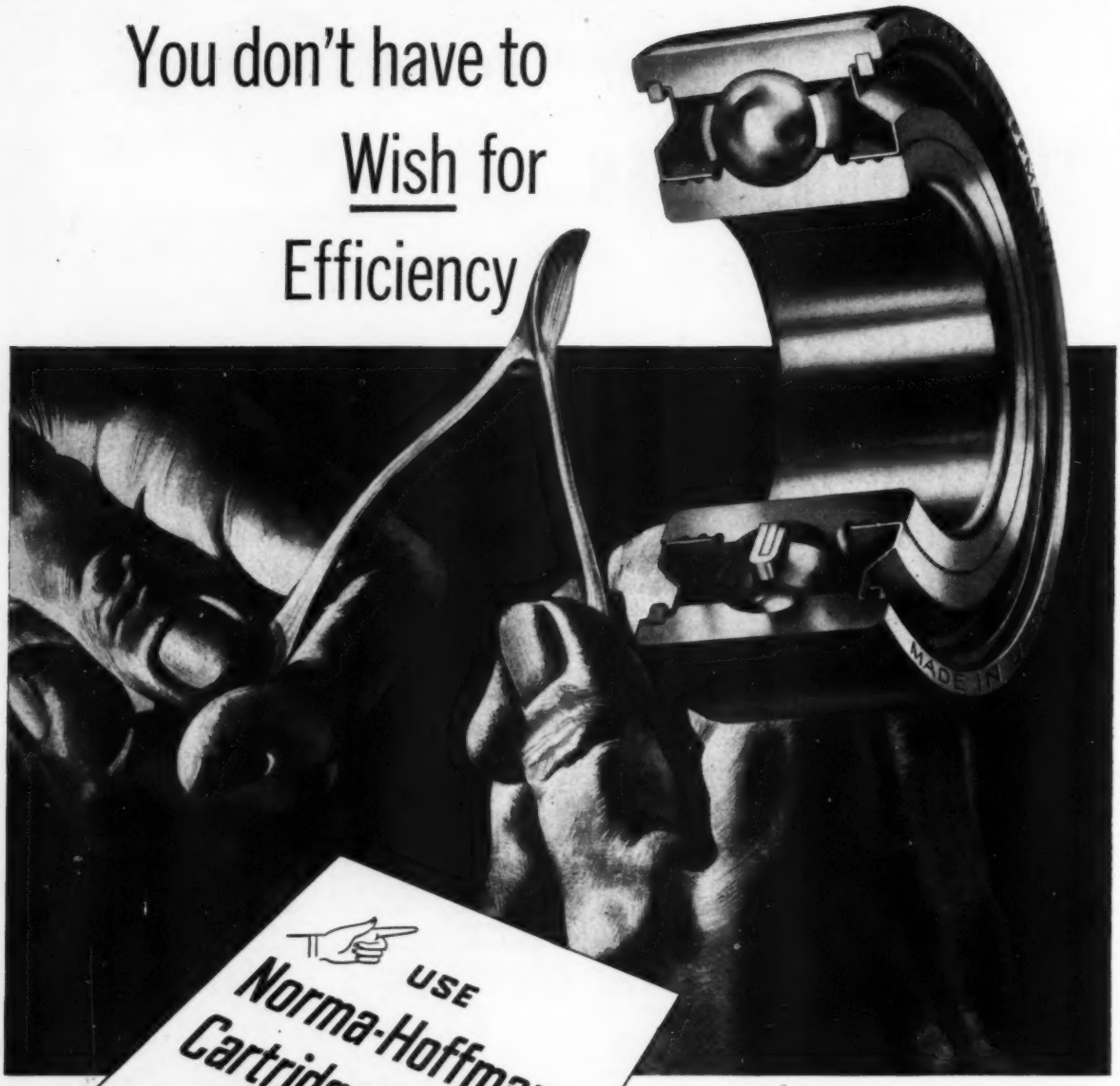
You don't have to Wish for Efficiency



Bearing performance becomes a reality when you use the Norma-Hoffmann "Cartridge" Bearing in your products. This double-row width bearing has 100% greater grease capacity than conventional bearings. The highly efficient seals lock grease in . . . keep dirt out. Carefully factory-packed with Norma-Hoffmann's specially compounded grease assures high antifriction performance for years on end. These are but a few of the reasons why the Norma-Hoffmann "Cartridge" Bearing is *"America's No. 1 Sealed Bearing."*

Norma-Hoffmann

AMERICA'S NO. 1 SEALED BEARING

NORMA-HOFFMANN BEARINGS CORP.
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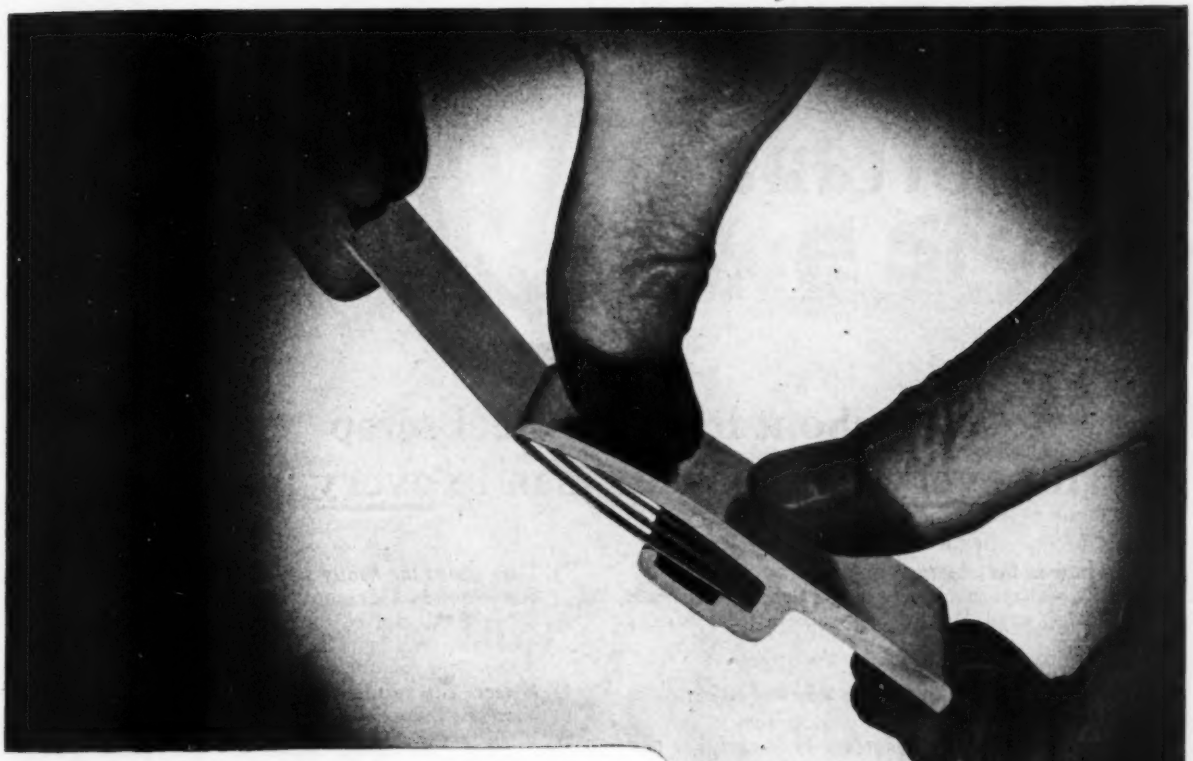

LODDING DOCTORS

Immediate Fit . . .

Minimum Blade Pressure

. . . Quick Blade Change

Important Questions..

about iron and steel scrap for every top business man in every industry

Q. *How* bad *is the shortage of scrap?*

A. Actually, we have enough scrap to get along, but too much of it is *light* scrap. What is badly needed today is more *heavy* scrap.

Q. *Why more* heavy *scrap?*

A. Because heavy scrap will produce *more and better* steel in *less* time.

Q. *Why is the heavy scrap shortage so* harmful *to our economy?*

A. Half of all the ingredients that are melted to make steel and castings consists of scrap iron and steel. The short supply of heavy scrap during the past year limited the production of steel mills and foundries. At the present record rate of production, there is still not nearly enough steel to meet the current and anticipated demands of our domestic economy, military requirements, and ERP. More heavy scrap will help bridge the gap.

Q. *What's being* done *about it?*

A. A drive . . . and everybody is cooperating . . . is being started for industrial scrap, to (1) help step up present steel production, and (2) *create a visible reserve of heavy scrap in the event of national emergency.*

Q. Why *is there a shortage of heavy scrap?*

A. Several reasons:

1. Very little of the 123,000,000 tons of steel and steel products exported during the war has come back as scrap.
2. With replacements scarce and expensive, much old equipment which would normally have been junked by now, is still in use.
3. A halt has been called on the junking of old vessels and military equipment which has until recently been a source of scrap.
4. The amount of heavy scrap produced in fabrication —the left-overs of machinery, etc.—is not enough to meet the demand for new steel and castings.

Q. *How about the heavy scrap that must exist in huge quantities in* Germany *and* Japan?

A. Some of this will be coming through, but not in good quantities until preparation and transportation facilities within those countries improve.

Q. *Where can* additional *scrap be obtained from domestic sources?*

A. From industrial plants which have on hand large amounts of heavy scrap in the form of obsolete machinery, idle equipment—tools, dies, jigs, fixtures, etc.—and unnecessarily large repair parts inventories. Such scrap is the best possible type for the manufacture of quality steel.

Q. *Isn't such material* ordinarily *turned in as scrap?*

A. Experience shows that plant "housekeeping" is not particularly good when plant production is high. People are too busy. However, if executives realized the critical situation, they would order the necessary steps to be taken.

Q. *How can I help in this drive?*

A. Appoint one top official in your plant as a Salvage Director —with full authority to give orders and throw out everything that is not going to be needed. Have him consult with your trade association's Steel Scrap Drive Committee. Call in your local scrap dealer. (Incidentally, the prices paid for scrap are the highest ever.) Promote your scrap drive by meetings of department heads and through plant bulletin boards and newspapers.

Q. *How do I benefit from moving scrap in addition to the money received for it?*

A. 1. You get the use of much-needed and expensive floor space now occupied by such equipment and material.
2. You eliminate the cost of keeping records and inventory.

Q. *When does the scrap drive* start?

A. Right this minute. The very next thing to do after reading this page, should be to start *your* plant's scrap drive!

Q. *What is the goal of this drive?*

A. One million tons of *heavy* scrap . . . and "housecleaning" in your plant will help.

A PUBLIC SERVICE PROJECT · THE ADVERTISING COUNCIL

SCRAPPY SAYS:

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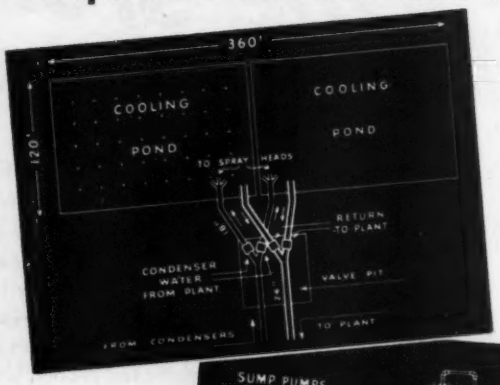
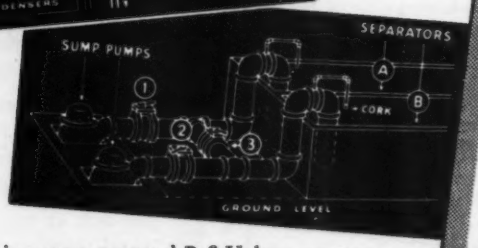
R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •

Simplified Control and Shut-Off





Four 18-inch electric motor operated R-S Valves are controlled by manual switches from the power plant in the condenser water cooling pond installation. This arrangement permits the use of one or both cooling ponds or the draining of either or both.

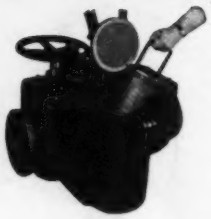
In the illustration of sump pump discharge, the plant sewer lines drain into the sump where the waste is pumped into concrete separators through R-S Valves 1 and 2. Valve 3 in the connecting line provides a means of cleaning either A or B separators as the ¾ inch syphon breakers can be plugged with corks and the fluid syphoned from the separators to facilitate cleaning operations.

50-pound R-S Iron Valves are utilized in both of these installations. They are designed for rugged hydraulic service with a large safety factor for line stresses, water hammer, and other abuses. Available with 25-pound or 125-pound American Standard flanges, the usual four types of manual control or power controlled prime movers of various types. Furnished in any metal that can be cast or welded including steel with Series 15, 150-pound American Standard flanges.

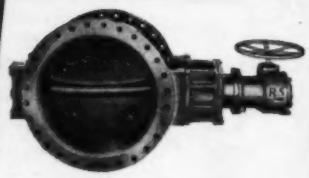
The angular seating disc gives wedge-type closure. For positive 100% shut-off, these valves can be fitted with the renewable, replaceable R-S patented rubber spool.

Consult the R-S representative in your locality. His experience can be extremely helpful. You will find the address and phone number listed under "R-S Products Corporation, Valves."

R-S Products Corporation, Wayne Junction, Philadelphia 44, Pa.



R-S Duplex Strainer. 2½ turns of single handwheel permits alternate removal of identical basket strainers without interruption to flow. Valve controls strained water only resulting in reduced corrosion.



No. 709. 50-pound Cast Iron Valve can be equipped with rubber spool for positive shut-off. Heavy duty handwheel control. Taper pins in vane are for positioning only; vane is keyed to shaft.

No. 579. Heavy Duty Float-operated Valve for control of liquid level. Supplied in any desired metal to resist corrosion by liquid controlled.

No. 602. 24-inch 150-pound Cast Steel Valve with Series 15 raised face flanges, air-cylinder positioner, handwheel and declutching unit. Constant 90° angularity between prime mover and valve stem. Controls liquids or gases.

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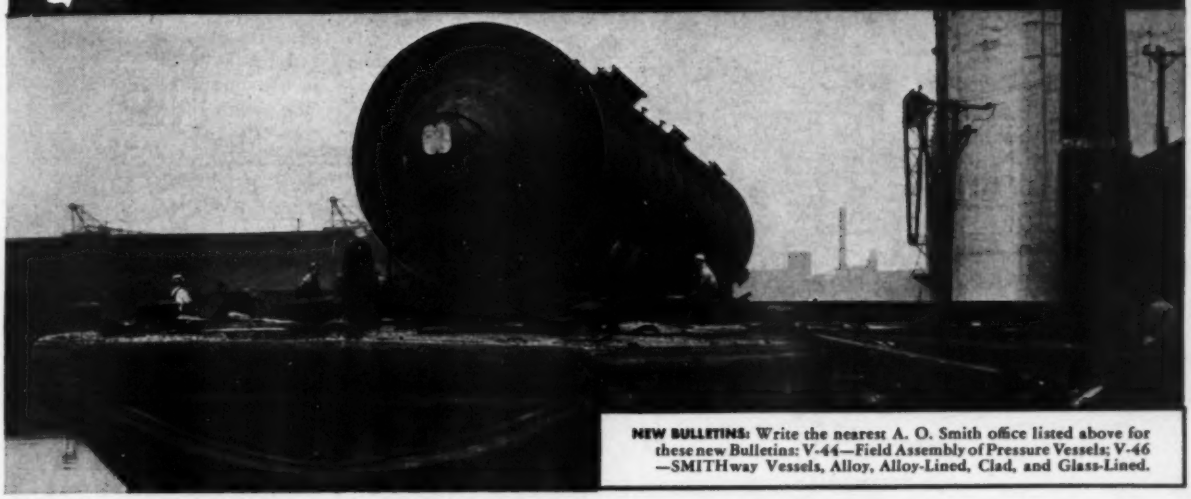


NEW BULLETINS: Write the nearest A. O. Smith office listed above for these new Bulletins: V-44—Field Assembly of Pressure Vessels; V-46—SMITHway Vessels, Alloy, Alloy-Lined, Clad, and Glass-Lined.

BY WATER AND RAIL, A. O. Smith ships pressure vessels for the petroleum, paper, and process industries. The SMITH-lined Fractionating Tower above, one of the largest shop-fabricated vessels ever built (16 ft. diameter by 116 ft. long, weighing over 320,000 lbs.), is going by barge to an oil refinery in the Chicago area.

SOME 60 SMITHway PRESSURE VESSELS for both low and high temperature service have been ordered during the last four years by one company to equip two new plants. This SMITHway Tower, three railroad cars long, 116 ft. by 7 ft., weighing 137,000 lbs., is one of the types of vessels furnished.

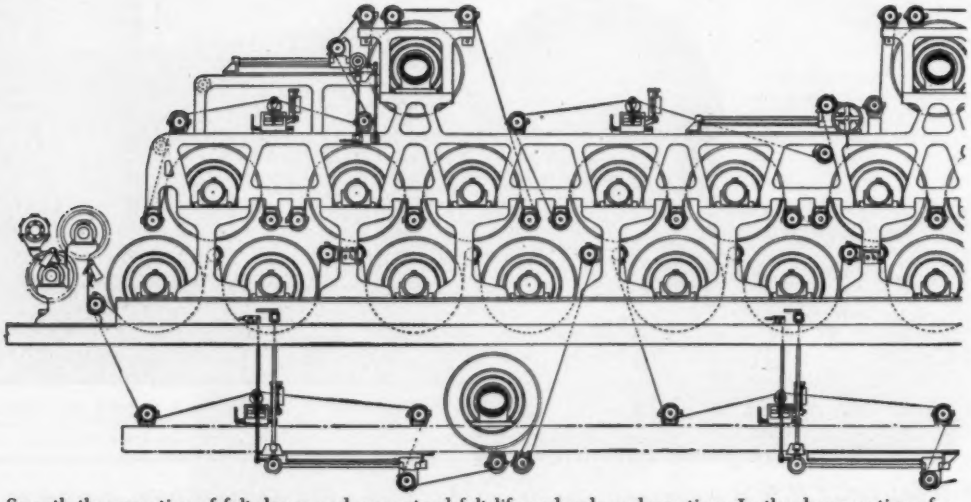
THIS MAN KNOWS HIS CURVES: For 23 years, Frank Hilke has been shaping, to exact diameters, the shell courses of SMITHway Pressure Vessels. He uses a variety of rolls which can produce any diameter needed for pressure vessels.

RECORDING CONTACT RESISTANCE AS LOW AS 1/1,000,000 OHM. Knowing the amount of surface or contact resistance is an important factor in maintaining the consistent quality of the resistance spot welding used in SMITHlining pressure vessels. This resistance, which varies with each type and thickness of alloy lining used, and which can affect heat input and strength of the weld, is measured in this special SMITH-designed and SMITH-built machine.

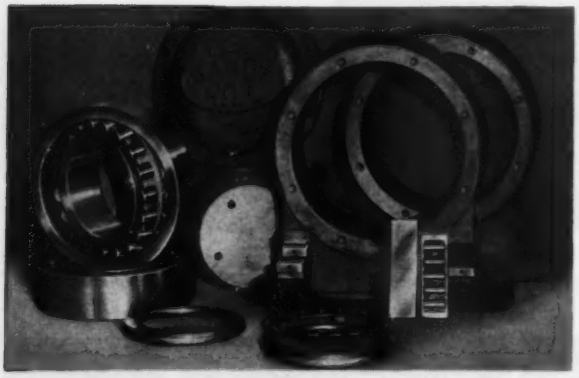
Torrington Spherical Roller Bearings Will

Extend Felt Life

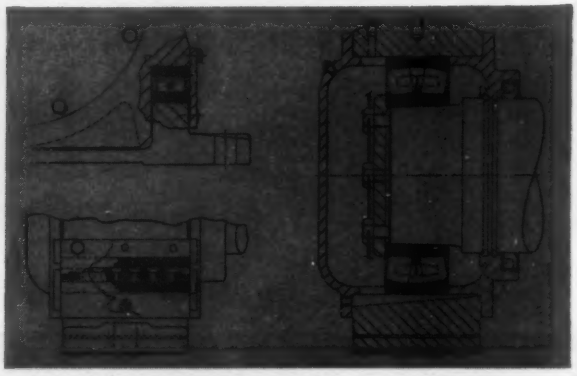
on Sandy Hill Paper Machines



Smooth the operation of felt dryers and you extend felt life and reduce down time. In the dryer section of a new paper machine, shown in the elevation drawing above, The Sandy Hill Iron & Brass Works gains these advantages with Torrington Spherical Roller Bearings and a unique Torrington tending side mounting. Proper alignment, vital if journals are to turn freely, becomes *automatically certain* with these *self-aligning* bearings.



Inspection and mounting of the bearings can proceed rapidly, thanks to the simplicity of the housing and the unit design of the bearings. Tapered journal and bearing bore make it easy to secure proper internal running clearances by controlling the amount of expansion given the inner race.



Expansion and contraction of the felt dryers are accommodated by the tending side mounting shown here in cross-section. This Torrington design incorporates two ladder type bearings that allow free axial movement. This mounting, together with the self-aligning bearings, results in lower roll friction and reduces felt wear.

Where heavy loads and shaft deflection are problems, you can improve operation and minimize maintenance with Torrington Self-Aligning Spherical Roller Bearings. Our engineers, skilled in solving routine and unusual friction problems, will gladly work with you on your requirements. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind., Torrington, Conn., District Offices and Distributors in Principal Cities.

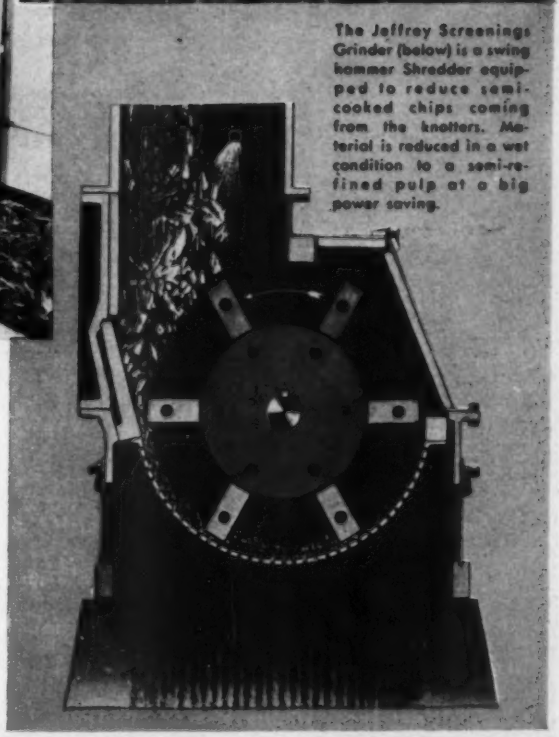
TORRINGTON SPHERICAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Straight Roller **Needle • Ball • Needle Rollers**

Pulpwood — CHIPS, SCREENINGS

Jeffrey builds a variety of handling, feeding and reduction equipment for the Pulp and Paper Mill. Chain conveyors for handling pulpwood; Belt conveyors for bark, chips and pulplap; Feeders for any number of feeding operations; Bucket elevators for handling salt cake, lime or wood chips; Re-chippers, Grinders, Shredders and Crushers for the reduction of chips, salt cake, bark, etc

The Jeffrey Screenings Grinder (below) is a swing hammer Shredder equipped to reduce semi-cooked chips coming from the knotters. Material is reduced in a wet condition to a semi-refined pulp at a big power saving.



For many years Jeffrey has been serving the pulp and paper industry . . is fully qualified by experience to provide the utmost in efficient and economical handling and reduction methods. Check with the most modern mills . . you'll likely find some type of Jeffrey equipment on the job . . and remember, that Jeffrey-equipped means efficient operation.

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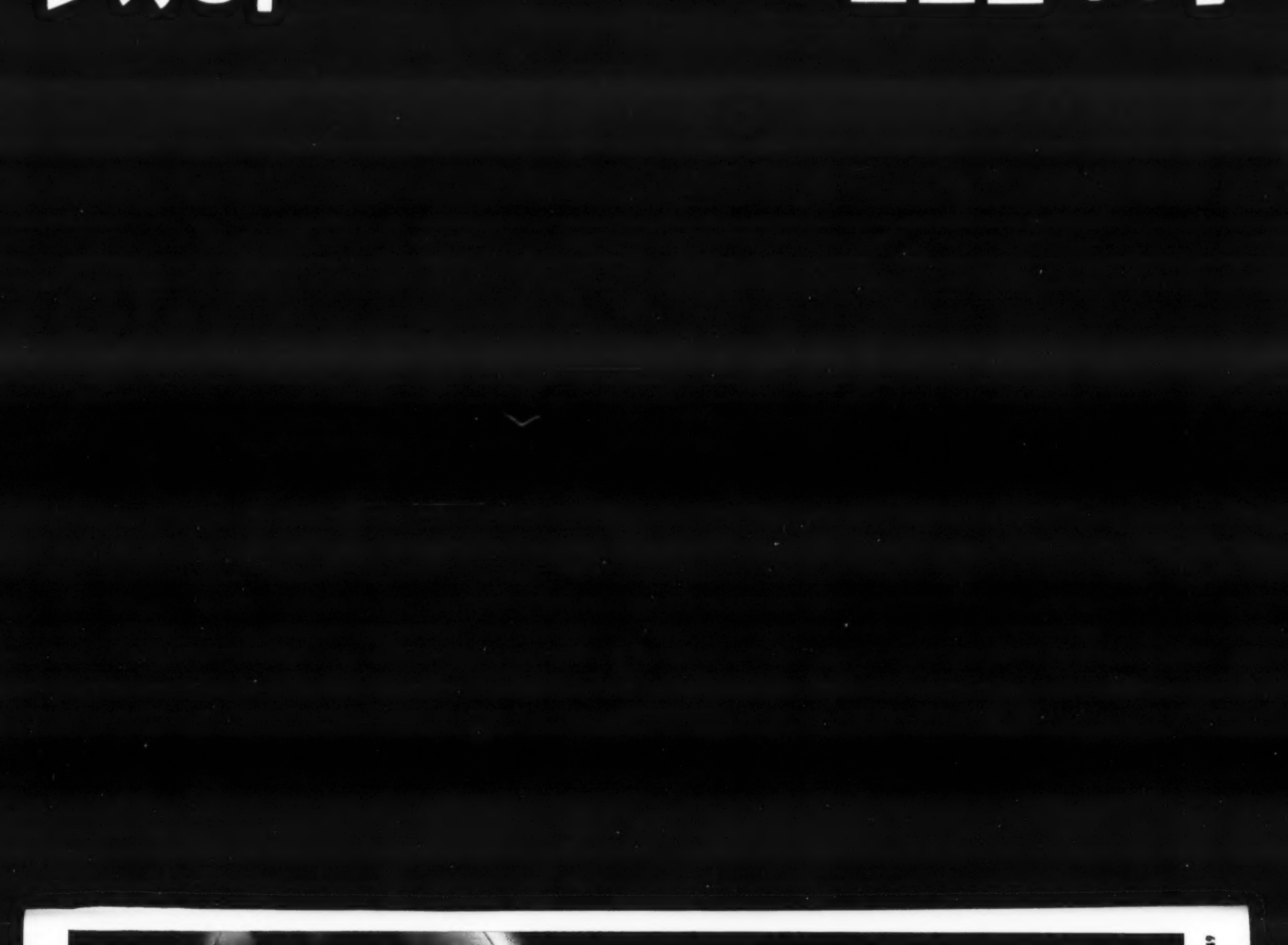

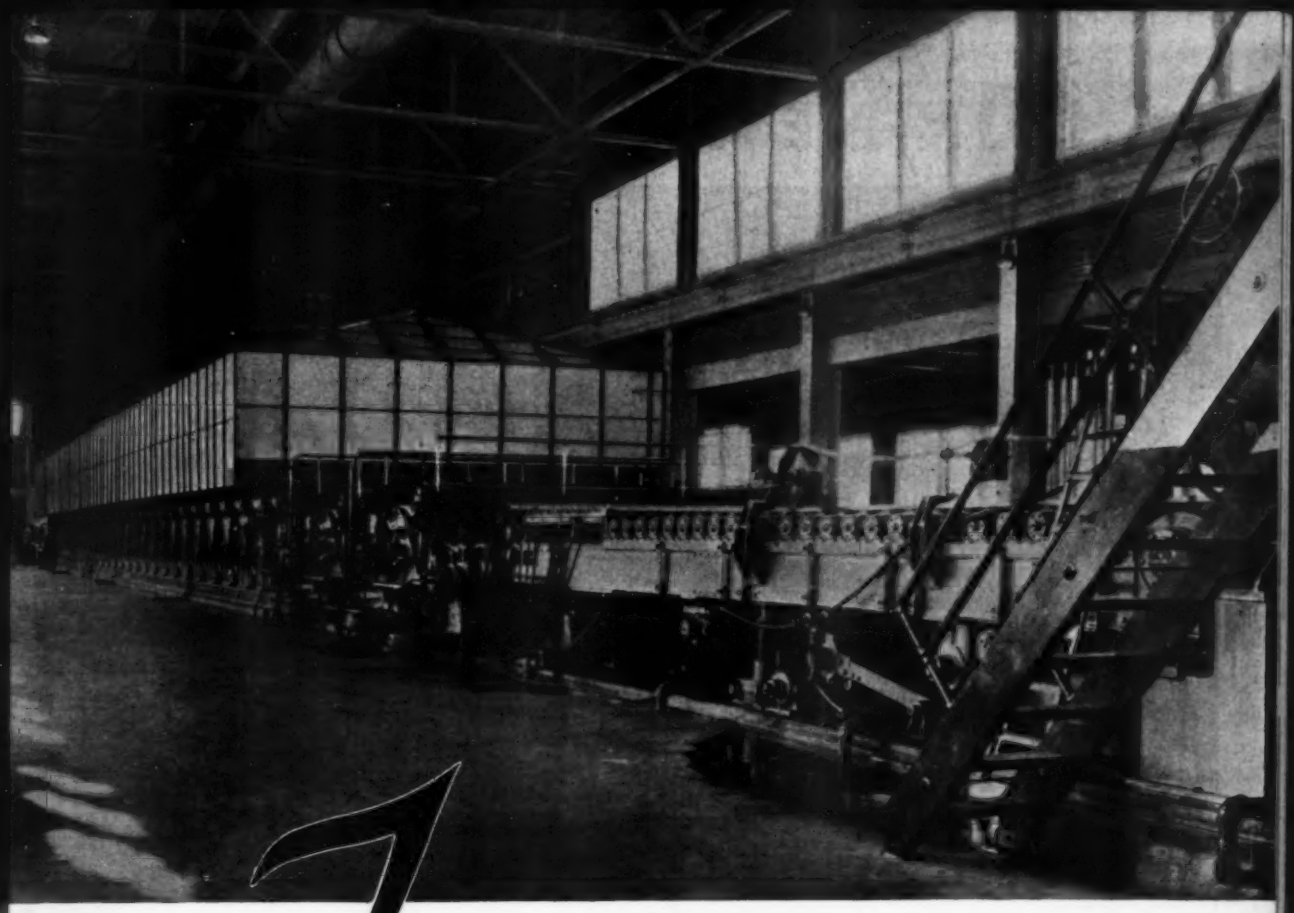

THIS is just one of many Bagley and Sewall Paper Machines that are producing tons and tons of paper in every section of the globe . . . every kind of paper — kraft, tissue, news, board, bond, book, etcetera, etcetera. Bagley and Sewall Machines have been in operation since 1889, and a number of those first machines are still producing paper.

Bagley and Sewall Machines are built to produce paper efficiently, economically . . . and for years. Over the years we have originated many new practices for more efficient paper production and kept pace with the proven ideas of modern paper machine design.

When new paper making equipment for your mill is in the "elementary thinking stage," call us in. Our engineers will gladly work with you in the development of your ideas for better, more efficient paper production.

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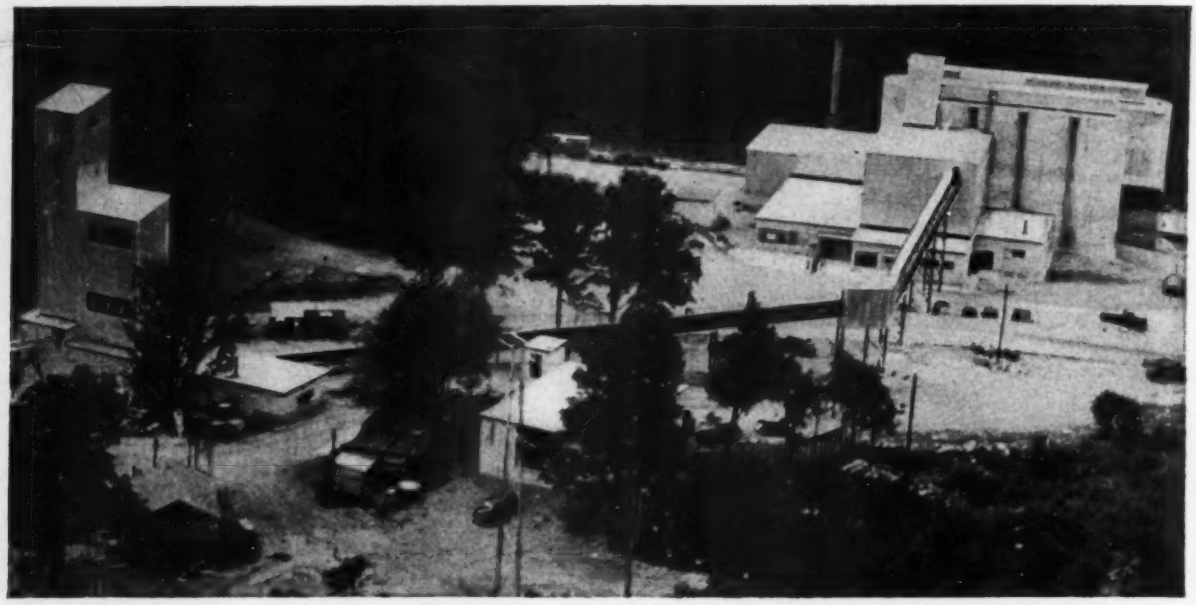
BUILDERS OF PAPER MAKING MACHINERY

OUR NEW TALC PLANT



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THE PAPER INDUSTRY
and PAPER WORLD
FEBRUARY 1949

Editorial

Another Milestone for TAPPI

▸▸▸ SINCE ITS BEGINNING, the Technical Association of the Pulp and Paper Industry has been a major force in pushing back the frontiers of science and technology in our industry. Its accomplishments are many, including the development of TAPPI standards, monographs, and special reports on many subjects. Most important is the influence the TAPPI has had in developing a spirit of cooperation among the technical men in the industry. Success of this effort is evidenced by the growth of the organization and by the wide participation of members in both local and national meetings.

Last month, TAPPI embarked on a new venture. In conformance with a decision of its executive committee, and after a year of preparation, TAPPI is now publishing its own official organ. Its avowed purpose is to increase its service to its members. If success in past endeavors is any indication of the future, the industry will be well served.

Time for Spring Cleaning

▸▸▸ SINCE WAR limitations were lifted, the volume of worn-out and obsolete equipment replaced by the paper industry has been great. Some has been disposed of but much of it is still taking up valuable storage space on the premise that it may be useful some day, either as a spare machine or as a source of spare parts. However, the potential usefulness of worn-out machinery is small. Even for the occasional emergency, it is often cheaper and quicker to obtain new parts. Worn-out equipment long since has paid for itself and is little more than junk to be disposed of as such.

Now comes an appeal that may furnish the extra push needed to get an early start on clearing out some of this discarded machinery. The Department of Commerce is asking industry for a million tons of heavy iron and steel scrap to help increase the production of steel and castings to meet the demands of our domestic economy, military requirements and the foreign aid program.

Last year scrap constituted more than half of every article made of iron and steel. This year scrap requirements have increased because the productive capacity of the iron and steel industry has expanded. This expansion, plus the halt that has been called on junking of old vessels and military equipment, as well as the fact that very little of the huge tonnages of steel and steel products shipped overseas during the war can be returned to this country, has resulted in a serious shortage of heavy scrap.

Only a sixty-day inventory of scrap is on hand at the steel mills. Despite conditions of local scrap markets, the need for scrap is great and the price is still high. To obtain a stockpile of scrap to tide us over in event of emergency it is necessary for each mill to put forth a special effort in making this scrap drive a success.

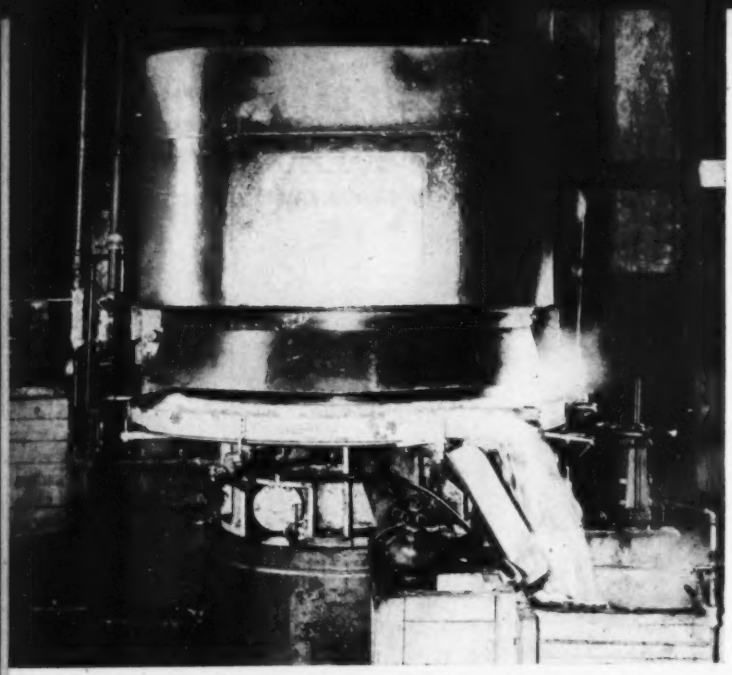
Participation in the scrap drive will pay off in several ways. Besides helping to increase steel production and to build a national stockpile, each contribution will clear valuable storage space and will bring a good monetary return. Now is the time to start your spring housecleaning.

On International Understanding

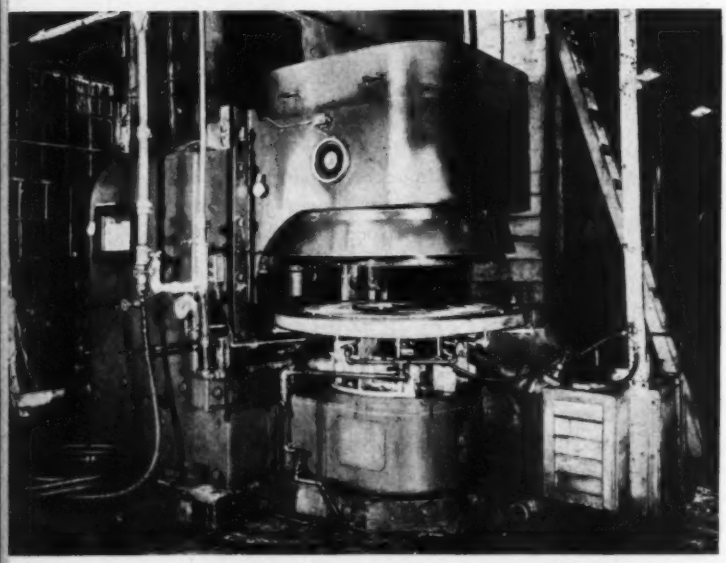
▸▸▸ MANY OF THE HOPES for "one world" have been destroyed by repeated failures of nations, both individually and collectively, to settle their differences amicably. International understanding, however, is fostered by international trade, but international trade is often restricted by artificial means. While the subject of tariffs and trading regulations is one on which even the best informed minds do not agree, it does seem that present world conditions warrant increased attention to such problems.

Along this line, R. M. Fowler, president of the Canadian Pulp and Paper Association, in his annual report, urged a broader flow of goods in both directions between Canada and the United States. We quote ". . . if there is real sincerity in our efforts to establish a multilateral system of world trade, the place to begin is on this continent. If two countries with the similarity and the close integration and the friendship of the United States and Canada cannot achieve a reduction of the barrier between them, then there is little hope for the future of trade between those countries that lack our closeness and understanding."

Mr. Fowler has made a good point. Businessmen and statesmen on both sides of the border might well study and reevaluate the pros and cons of tariff regulations. It would be a positive step toward better international understanding.

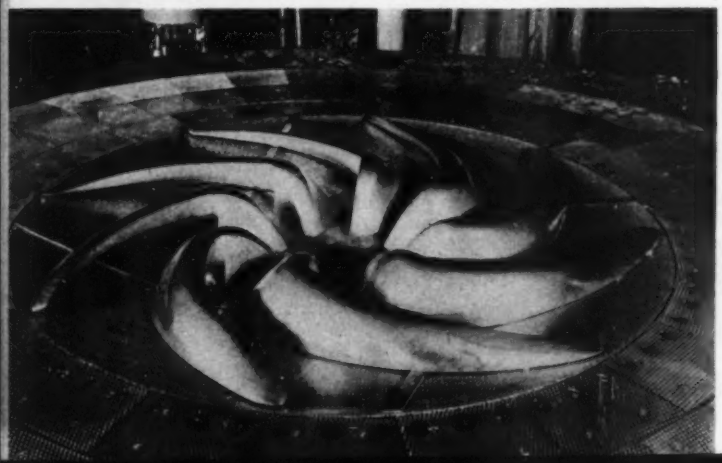


Curlator imparts fiber characteristics hitherto unknown or unrecognized and completely defibers shives and screen rejects



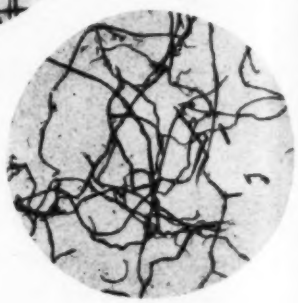
Pulp nodules roll between surfaces of a stationary lower plate and a gyrating upper plate under pressure of 15 psi or less

Stock entering center of lower plate is dewatered as it is moved outward over cone shaped perforated plate by rotor vanes



AFTER—same fiber after curlation (below)

BEFORE — uncurlated sulphite fiber (above)



Curled Pulp...

▸▸▸ A NEW PROCESS which employs a discovery of significant principles of fiber treatment was first announced last month at the 1949 annual meeting of the Technical Section of the Canadian Pulp and Paper Association. The process has been developed by technologists of Price Brothers and Company, Limited, manufacturers of newsprint and board, with mills at Riverbend, Kenogami, and Jonquier, Quebec.

A commercial machine known as the Curlator (trade-mark used by Curlator Corporation, 565 Blossom Road, Rochester, New York, patent pending) has been designed and built by the Curlator Corporation, Rochester, New York, to carry out the process. The process widens the range of quality obtainable from a given pulp and permits entirely new combinations of pulp properties.

How It Works

Dominant characteristic of pulp subjected to the mechanical treatment of the Curlator is a permanent change in the shape of the individual fibers toward more bends, kinks, and twists. This effect is brought about by causing nodules or crumbs of high consistency pulp to roll in changing directions between two surfaces which compress the nodules as they roll. Individual fibers are thus subjected to innumerable short radius bends over and about one another and, since cellulose and ligno cellulose fibers are somewhat plastic, particularly when wet, the bends, kinks and twists tend to take on a more or less permanent set. This flexing action not only changes the configuration of pulp fibers but it exerts a powerful

TRADE WINDS

...A New Fiber Treatment Process Developed in Canada

defibering action on shives and fiber bundles.

Essentially, the process can be effected on a small scale by rolling a nodule or crumb of pulp with a circular movement between the thumb and finger for a fraction of a minute. The same mechanical action is applied by the Curlator which first dewaters the slush pulp to a consistency of 15-25 per cent to form nodules. The nodules pass between a stationary lower plate and a gyrating upper plate to which pressure is applied to compress the nodules while they are rolled. The two plate surfaces are roughened to provide traction so the nodules will roll without slipping, smearing or shearing. Temperature and *p*H are important variables that affect the process.

What It Does

The process causes a change in all pulp properties in degrees and variations. In general, however, the effect is toward a softer pulp and is thus somewhat opposite from the effect of beating. Freeness tends to rise. Compared to uncurlated fibers, curlated pulp possesses lower bursting and tensile strength with higher tear and increased stretch and porosity. The curlation effect is in evidence when applied at any degree of beating and to some extent is retained through subsequent beating.

Sheets of curlated pulp possess an even textured matte-like appearance and the surface appears more optically level with less gloss and better apparent brightness. Where dye is applied curlated pulp appears to have a deeper color for a given amount of dye. Opacity tends to increase.

Another effect imparted by curlation is that wet pulp is more readily dewatered than untreated or beaten pulp. It will also give up water vapor more easily on drying. In terms of paper mill operation, then, these properties would indicate a dryer sheet at the couch or press section together with lower steam requirements at the dryer section.

Undoubtedly the most significant fact of the new process is that it extends the existing range of pulp properties and combinations of properties. It breaks through the established boundaries that have limited the field of stock preparation. A given pulp can be developed further and in more directions and a given raw material can be made to serve a wider range of requirements.

For instance, the development of a softer pulp is of interest to manufacturers of tissues, book papers and folding boxboard. Improved appearance and better optical properties are important in most types of paper. Increased stretch properties are important for many uses such as for printing papers or the resistance of paper bags and cartons to rupture by impact. High wet stretch is useful in wet molding and embossing. Greater stability of sheet surface imparted by curlation is of interest where scuffing, fuzzing and sheet curl are factors.

Economically, most direct interest is in the possibilities of higher pulp yield. Harder pulps resulting from high yield cooks are made acceptable by the softening action of curlation.

First commercial trial was in a newsprint sulphite system to permit an increase in pulp yield at the Price Brothers' Riverbend mill. The Curlator was placed in service in a closed system for screen rejects and the digester yield was increased in steps until the amount of rejects reached the full capacity of the unit to treat them properly. About ten per cent increase in yield was obtained with practically all of the digester yield acceptable for newsprint.

High Yields Possible

Results were satisfactory as to both operation and quality of product and the equipment and method proved entirely satisfactory over eight months of steady operation. From 30 to 45 tons of screenings per day were treated at 1 to 1½ hp per ton of treated pulp.

This increase in yield resulted in a saving of approximately 10 per cent wood which at present day costs represents a substantial dollar volume. About 10 per cent savings in steam and chemicals was experienced. Increased value of pulp resulted from the upgrading of screen rejects to No. 1 newsprint pulp.

While the bulk of the work has been applied to sulphite pulp for newsprint and board, the curlation process has been found to have similar effects on sulphate, soda and groundwood. Each type of pulp has its own characteristics, however, and little detail has been reported on pulps other than sulphite.

Abridgments of the two papers describing this new process and the Curlator will be found in Convention Papers . . . Abridged, this issue.

INSTALLATION OF PAPER MACHINE UNDER WAY AT WEYERHAEUSER SPRINGFIELD (ORE.) PLANT

▶▶▶ MACHINERY installations are now being made at Weyerhaeuser Timber Company's new container board plant at Springfield, Oregon, according to an announcement made January 22 by Marvin C. Jones, who recently assumed his duties as pulp division manager at Springfield. Previous to his association with Weyerhaeuser, Mr. Jones was connected with The Michigan Carton Company, Battle Creek, Michigan (Cf. P. I. and P. W. January, 1949).

Parts for the paper machine are now on the site, and sixty freight cars are bringing component units to Springfield from the Rice Barton Corporation, of Worcester, Massachusetts. An R-B representative will supervise the machine's installation in a room 580 ft. long by 60 ft. wide. The machine will turn out 12-ft. container board at several hundred lineal fpm. Maximum speed of the machine is 1000 fpm.

The paper machine will manufacture two grades of board from unbleached kraft or sulphate pulp produced at Springfield. One is corrugating board, forming the center sheet in the normal corrugated carton.

The second grade is kraft liner board used for the two outside sheets of the finished carton board. Both grades will to be delivered to Pacific Coast carton manufacturers.

These companies manufacture fiber containers or boxes for various packing purposes. Principal use is for packaging canned and bottled food stuffs produced by the West Coast's important canning industry. The new container board plant will meet a large portion of the increased local demand for this type of product.

Forest utilization significance of the new plant was emphasized by company officials.

Raw material will come from the company's related logging and sawmilling activities on the Springfield site, as wood otherwise not suitable for lumber production. Douglas fir will be the principal species, in mixture with hemlock and other trees.

Small diameter logs recovered in prelogging of old growth stands and low grade logs of other types, normally left in the woods, will boost the loggers' harvest on the Calapooya Tree Farm because they can be used for pulp production.

Sawmilling facilities on the integrated Springfield site will contribute a substantial part of the kraft mill's raw material. Slabs and edgings not suited for lumber production will end up as chips.

These slabs have a high value for pulp because they are largely of sapwood content. The new kraft mill will have sufficient capacity to absorb some surplus "waste" material from other sawmills in the area.

Huge digesters in which wood chips are cooked to pulp are now in place at Springfield. Evaporators and recovery boilers are nearing completion. In these units waste cooking liquor is concentrated and burned for recovery of chemicals and steam energy.

In preparing pulp from the wood chips by the kraft process strong caustic or alkaline cooking liquor is used. The sulphite process, in contrast, uses acid cooking liquors and can utilize only hemlock, spruce and white fir wood as raw material.

It has always been standard practice in the sulphate or kraft process to recover all of the waste cooking liquor. Economics of the process require this recovery because of the high value of chemicals which can be reused.

Waste cooking liquors will be completely washed from the pulp, evaporated to a high concentration and then burned in a specially designed steam boiler.

Effluents other than waste cooking liquor will be treated by a special process to remove any chemicals that might be objectionable if discharged into the river. This equipment was developed in Sweden a number of years ago and has been in successful operation there for several years.

Oregon State sanitary engineers have reviewed plans for the Springfield plant and added their approval. Through these co-operative efforts, the new kraft mill will be as free as possible of injurious effluents.

The Springfield plant will produce 150 tons of container board daily. It will operate on a full 24 hour, three-shift basis and will employ about 175, many of whom will be experienced in the special skills involved.

Commercial-Sized Waste Disposal Plant To Be Constructed in Kalamazoo Valley

▶▶▶ REPRESENTATIVES OF six paper mills in the Kalamazoo River Valley have signed an agreement for construction of the first commercial-sized trial deinking waste disposal unit in the history of the Valley's paper industry. Construction of the unit, which will be built at the plant of the Michigan Paper Company, Plainwell, Michigan, will start as soon as preliminary details can be completed. Announcement of this development came from Milton P. Adams, executive secretary-engineer of the Michigan Stream Control Commission, who has been active in the project from its inception (Cf. P.I. and P.W. p. 204, May, 1948).

Participating in this project are the Michigan Paper Company, Plainwell; the Kalamazoo Paper Company, the St. Regis Paper Company, Rex Paper Company, and Allied Paper Mills, of Kalamazoo; and the Watervliet Paper Company, Watervliet. The site chosen is the place where the first pilot plant designed by Philip F. Morgan, demonstrated the soundness of the method designed for freeing the Kalamazoo River of wastes from mills in which the deinking process is the major source of river pollution (Cf. P.I. and P.W. p. 1405, January, 1948).

This plant, it is pointed out, will not take care of the insoluble wastes from the plant, but it will remove from the waste-water material that in the past has robbed the river water of its oxygen and thus proved inimical to fish. Handling of the settlable portion of mill waste water is still a problem to be solved.

At present, the legal phases of the work have progressed to signing of the agreement to form a nonprofit organization which will provide finances for construction of the waste disposal unit. The proposed organization probably will be known as the Kalamazoo River Improvement Company.

Next will come study by Tony Palladino, research director for the National Council for Stream Improvement, who succeeded Mr. Morgan as resident engineer. The study will determine flow and other technical factors which later will have to be incorporated in the over-all design from which construction plans will be drawn.

The pilot plant designed by Mr. Morgan as the result of his three years of work on the problem in the Valley handled approximately 60,000 gallons of waste-water per day. The commercial plant, it is reported, will be capable of processing upward of 500,000 gallons daily.

Mr. Morgan's work determined that

the organic material present in the deinking waste solution and which robbed river water of its life-giving oxygen, can be assimilated by a harmless type of bacteria. This bacteria is a nonpathogenic type which has no deleterious effect on the river water's oxygen content. It will be around this principle that the Plainwell commercial waste handling plant will be constructed.

Determination of the method to treat deinking wastes followed years of agitation by local residents and by the Michigan State Stream Control Commission. Before any work was undertaken, numerous surveys of river damage were made. The Stream Control Commission, of which Milton P. Adams is executive secretary-engineer, took increasingly strong stands in demanding some action to prevent pollution be taken by mills of the Kalamazoo River Valley.

Meanwhile, the mill technical men were carrying on their own studies of the problem under the Stream Control Commission's sponsorship. In 1945, Mr. Morgan took up the study in the Kalamazoo River Valley; he was obtained through the Mellon Institute for Industrial Research and the National Council for Stream Improvement. His work was done in the laboratories of Kalamazoo College with the assistance of research chemists at Michigan State College, East Lansing. He had support in his studies from the group of top executives who have now entered into the agreement to form the nonprofit organization mentioned. As yet there has been no formal organization, the work having been carried on through an informal agreement which provided the necessary financial backing.

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PICTORIAL STORY TOLD BY PUGET SOUND COMPANY

A deluxe book prepared for distribution at the end of the year to its stockholders by the Puget Sound Pulp & Timber Company, Bellingham, Washington, is entitled *Making Puget Pulp*. This attractive publication, size 11 x 14, is done in offset and is profusely illustrated with about sixty fine photographs.

The pictures with accompanying text describe the history of pulp and papermaking, the pulp making process, continuing through the manufacturing operations into the plants where pulp mill waste is converted into useful by-products. The text is done in concise, nontechnical form, and altogether this booklet not only tells a story about the company and its operations, but it may be classified as a gift book, one worth keeping.

Bryant Division of St. Regis Welcomes Visitors to Open House

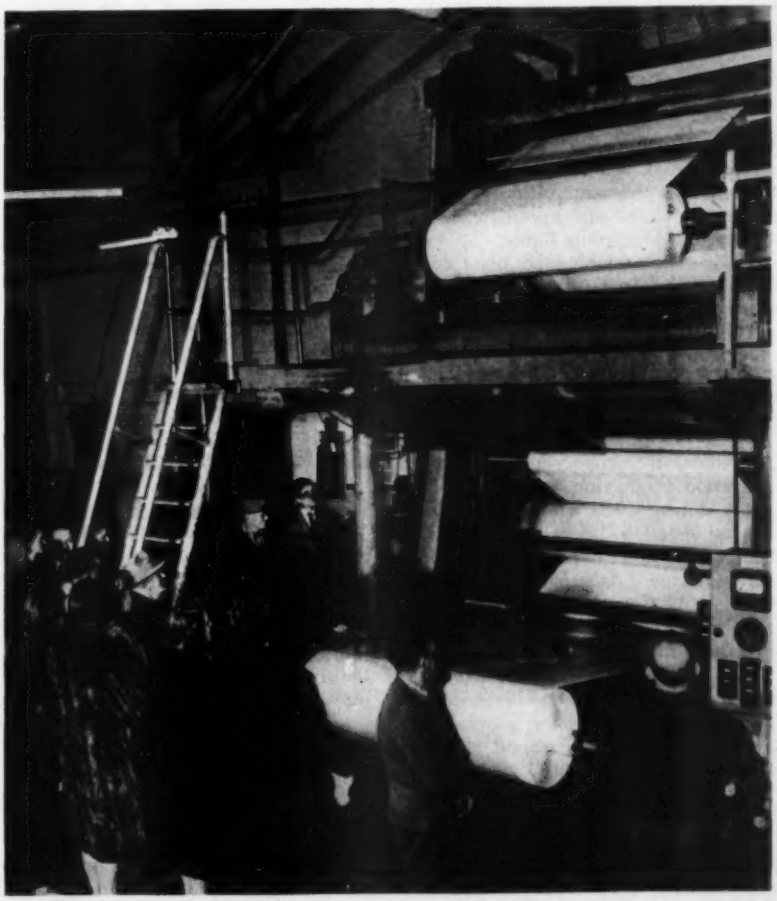
▶▶▶ WELCOMED by management and the workers of the Bryant Division, St. Regis Paper Company, more than 250 Kalamazoo (Mich.) residents went on guided tours through the coating division in one of the few open house sessions in the history of the Kalamazoo Valley paper industry, January 12.

In order to give visitors an idea of the whole range of the paper manufacturing process, Bryant employees had rigged up a model paper machine, the first stop on the tour. From there workmen doubling as guides led the sightseers to the color room, then to the coating and drying rooms, to the calendering room, and then to the finishing room. There a well-stocked lunch counter with doughnuts, sandwiches and coffee regaled the visitors as they watched checkers and counters skilfully flip the big trimmed sheets.

Fred C. Goodwill, resident manager, had invited the public for the men of the mill. Workers had the big rooms spotlessly clean and were present as demonstrators of the various processes and machines. Well-lighted, with decorative explanatory panels and route arrows, it presented a far different picture than many who attended the event expected. Several wives of workmen were amazed, they said, to learn for the first time the sort of place in which their men worked, implying that previously they had not been welcomed as visitors.

"The men had gotten the mill cleaned up and in such good order they were proud of it and wanted to show it off," said Mr. Goodwill, "So we invited their families and the public to see how paper is coated."

The huge calendering stacks attracted much attention, especially the two new supercalenders, around which there were crowds all evening. A joint



Visitors watching supercalender in Bryant Division, St. Regis Paper Co., Kalamazoo, Mich., during one of the few open house events ever held in the Kalamazoo Valley paper mill history

union-supervisory committee arranged plans for the open house. Its members were Claude Bos, coating supervisor; Harold Foster, finishing supervisor; Eloise Gross, finishing stewardess; Harry Graff, calender steward; Allen Mulder, quality control supervisor; Rena Randall, union recording secretary; Cleal Tyler, finishing steward; and John Schoolenberg, coating steward.

James H. McClure, coating mill manager, acted as advisory chairman.

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LARGE NEW ALCOHOL PLANT AT GATINEAU NOW OPERATING

According to agreements worked out with Canadian International Paper Company, Commercial Alcohols, Ltd. will handle about 700,000 Imperial gallons daily of waste sulphite liquor in its newly opened plant at Gatineau, Quebec, Canada, which started operations last month.

The newly-opened Commercial Alcohols Ltd. plant was built at an approximate cost of $2,750,000. Claimed to be the largest plant of its kind in the world, it employs the basic process, used up till now only in Scandinavian countries, the U. S. A., and Canada, on a vastly smaller scale. Especially designed, the new Gatineau plant uses the latest developments in its particular process and equipment, designed to produce the highest quality of ethyl alcohol. Ethyl alcohol, produced from the sugars of the waste sulphite liquor, amounts to about one gallon for every 100 gallons of sulphite liquor.

Planned for a long time, plant construction, deferred till the war's end, was finally started late in 1947.

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SOUTHERN MILL CAPACITY AND PULPWOOD PRODUCTION SHOW INCREASE IN 1948

Continued increases in southern pulpwood production and in mill capacity during 1948 will be shown by figures soon to be released by the Southern Forest Experiment Station, New Orleans, Louisiana, says Director Charles A. Connaughton. Mr. Connaughton said 1947 figures showed that half the country's pulp capacity was in the South, and that 45 per cent of the country's pulpwood is cut in the South.

The previous year's report showed Louisiana leading in mill capacity with 3,408 tons daily for all mills, and Mississippi first in production with 1,279,100 cords cut in 1947. Director Connaughton said that from 1936 to 1947 the industry in the South had grown four times its original size, and that pulpwood production was 4½ per cent higher in 1947 than in preceding years.

One of the huge new presses which produce Gair folding cartons by sheet-fed gravure is demonstrated to Robert Gair Company's sales force by Halver T. Sorenson, technical adviser for the Gair company on gravure process printing

New Printing Process for Paperboard Is Demonstrated by Robert Gair Co.

▶▶▶ AT A RECENT meeting attended by the salesmen from its folding carton plants, Robert Gair Company, Inc., New York City, demonstrated a new printing process for paperboard.

The Gair company announced that folding cartons for the packaging field are being printed by a process which until now has been limited exclusively to fine art types of reproduction. The company states that sheet-fed gravure printing on paperboard is being produced for the first time in this country.

Gravure presses built to Gair's specifications to produce the highest quality of paperboard printing have been installed at the company's Piermont, New York, plant. Previously, such presses were only adapted for printing on paper.

After attending a lecture on gravure processes, the salesmen then toured the complete plant in groups to see the two huge new single-color and two-color sheet-fed gravure presses, the modern laboratory, the new high speed carton gluing machines, and other machines newly developed by Gair.

Now, absolute fidelity of reproduction on boxboard is assured. Sheet-fed gravure printing gives unusually faithful color reproductions of subjects drawn, or depicted by photography. It possesses a brilliance, depth and range of color values not obtainable by other methods.

Gair gravure is already planned for cosmetic, food and many other fields where realistic and artistic reproduction of the commodity or its use on the carton package, aids in sale of the product. Gravure makes a flower on a perfume carton look so real, you can almost smell it!

Norman F. Greenway, vice president of Robert Gair Company, states that application of sheet-fed gravure to folding cartons is expected to revolutionize their graphic designing. With gravure, unlimited types of art can be used on cartons. Manufacturers, in planning a carton to be printed by gravure, can draw upon the widest range of art and photographic techniques to achieve a dramatic package. Gravure will reproduce a lemon meringue pie on a folding carton so exactly, you'll want to lick the meringue off the carton!

Halver T. Sorensen has been appointed technical advisor on gravure process printing at the Gair company. Mr. Sorensen started in the printing business over fifty years ago in Chicago. He joins Gair after thirty-five years with Beck Engraving Company, Philadelphia, where he was general manager and for whom he started a letterpress printing plant in 1911. Sheet-fed gravure for paper was very popular in Europe where they turned out beautiful work, but good gravure machinery was not available here. Some twenty years ago, Mr. Sorensen asked an equipment company to build a gravure press, and aided them in its planning.

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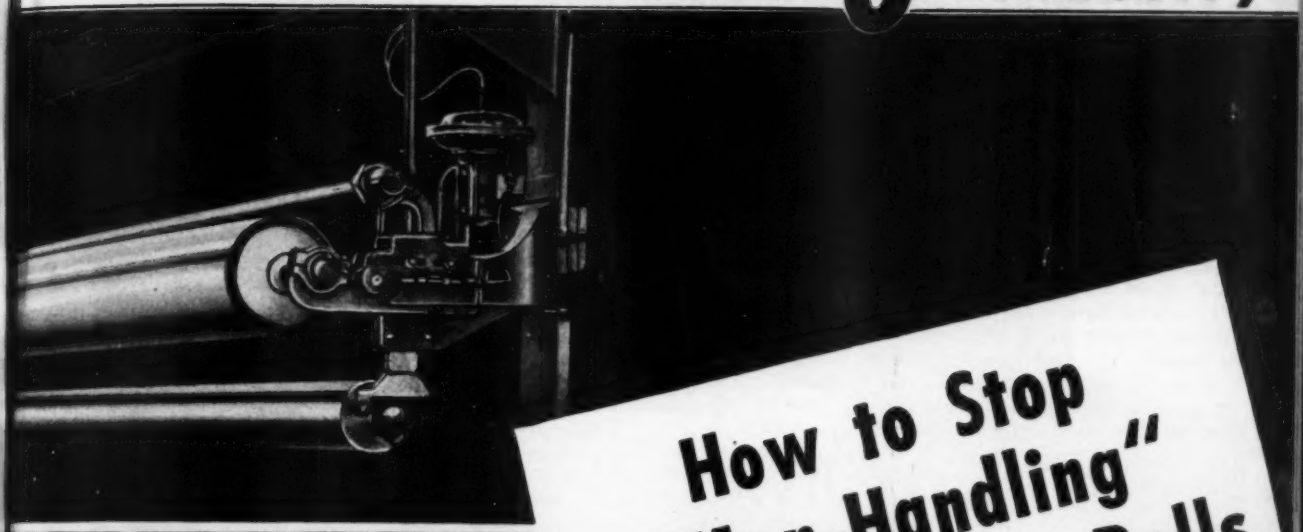
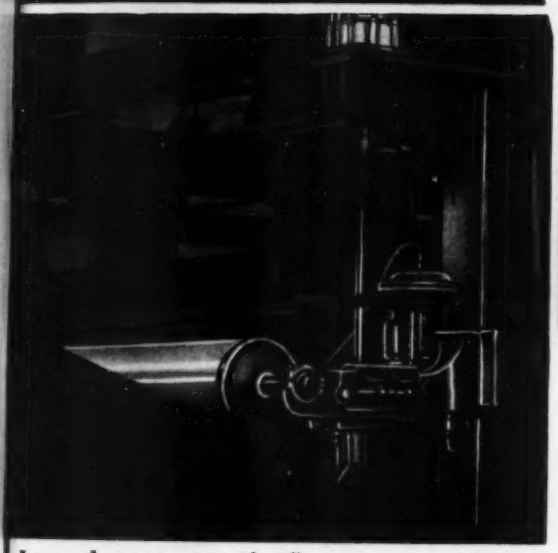
▶▶▶ THE SALE of the W. F. Robertson mill at Ashuelot, New Hampshire, to the Winchester Paper Company of Ashuelot, owned by Norman Eber, was announced by Clarence B. Oneal of Hinsdale, New Hampshire, president of the Robertson Company. This mill is one of three Robertson Company mills located in Ashuelot.

PAPER · · · America's 6th Industry

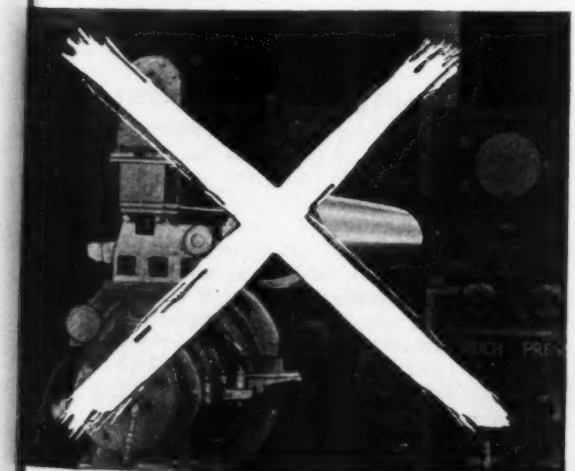


How to Stop "Man-Handling" Lump Breaker Rolls

Lump breaker roll and paper draw roll are raised pneumatically when installing fourdrinier wire with the new Puseyjones arrangement.



Improved arrangement with rolls in operating position.



Gone is the conventional mounting arrangement for lump breaker roll on suction couch. Chain hoist is no longer required. Simplifies wire change.

In the new Puseyjones Machines, the lump breaker roll and paper draw roll are lifted pneumatically for fast, efficient wire changing. Both rolls are permanently supported from the adjacent press frames and can be raised or lowered with a finger touch. Check these important advantages:

(1) Reduces down-time for wire change
(2) Eliminates use of crane
(3) Eliminates all man handling
(4) No chance of damage to the rubber roll

This is just one of the many design improvements and labor saving devices in the latest high-speed Puseyjones Machines. That's why you are years ahead with a new Puseyjones. Let us give you full details.

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THE SIGN OF TRADE MARK SUPERIOR QUALITY

Power Agreement Paves Way for Alaska Pulp Industry

▶▶▶ PRELIMINARY STEPS have been completed for the establishment of a new $25,000,000 dissolving pulp industry in the Sitka region of Alaska by the conclusion of the essentials of a power agreement between the city council of Sitka and the Alaska Development Corporation. While some technical details are to be adjusted, the Sitka officials have approved the basic agreement under which the plant will be located.

With this agreement essentially concluded, and the rights of the corporation to build on the agreed location guaranteed, the way is cleared for the negotiation of a contract with the Forest Service for the pulpwood necessary to supply the plant. Meanwhile negotiations are well under way for the financing of the enterprise, which is expected to be principally backed by the rayon industry. This industry wishes to assure itself an adequate supply of the raw material needed for conversion.

Under terms of the agreement the company must build a pulp mill at Sitka within thirty months or lose its power rights.

"The initial program," said Benjamin B. Mullen at New York (vice president and treasurer of the corporation), "is for an initial plant to produce 200 tons per day from spruce and western hemlock. Later the plan is to expand this production to 400 tons per day."

According to Mr. Mullen, the timber will be secured on a long-term contract with the Forest Service for pulpwood from the Tongass National Forest. The Forest Service has divided the Tongass Forest into four or five areas, each capable of sustaining a modern large-sized pulp mill, and the Ketchikan Company has already closed the principal details for one of the tracts. The Alaska Development Corporation is to have the pulpwood from another of the areas, which is estimated to have sufficient standing timber to maintain a 400 ton capacity pulp mill without depleting the area. On this basis the available source of supply will be replenished faster than the scheduled cutting can cut into the reserves.

It has not yet been decided whether the plant will use the sulphite or sulphate process in producing its pulp, that being left to future determination on the basis of the most recent technical developments in the pulp industry.

No date is given as to the probable time when the new plant can be completed, for such details as a contract with the Forest Service must first be concluded, and actual large scale financing cannot be started until firm contracts are closed for the pulpwood. The technical details involved in the power contract with the city of Sitka must also be concluded.

All the preliminary work is being rushed, however, and because of the interest of the Forest Service in the utilization of the vast Alaskan timber reserves, no serious delay is anticipated.

While the Alaska Development Corporation is incorporated in Alaska, its principal offices and officers are located in New York. Paul J. Timbal is president, Mr. Mullen, vice president and treasurer, and Simon J. Nusbaum, secretary. All of these officers are at the main office of the corporation, but a Seattle office is in charge of Roy W. Johnson, vice president in charge of engineering.

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FINANCIAL

▶▶▶ PAPER MILL securities showed a slight but general upturn at the end of January as compared with the low prices which followed the unexpected results of the national election. It may be significant that with a buyers' market developing there is a general trend toward a more rapid increase in the price of preferred securities than for the more speculative common stocks.

Celotex Corp.—Net income for the fiscal year ended October 31 was $6,785,188 as compared with $6,227,929 for the previous fiscal year. The company's annual report states that since early November there has been a sharp decline in demand for building material generally, but it is impossible to estimate at this time whether this is a return to the normal seasonal trend of some years ago or whether it is to be of longer duration. However, the need for housing is still urgent.

Fraser Companies—Net profit for eight months ended August 31 was $3,774,093 as against $3,480,375 for the entire year of 1947. These figures include both the Canadian and United States mill profits.

Marathon Corp.—Net earnings for the fiscal year ended October 31, 1948 (after income tax provisions) were $5,593,238 as compared with the preceding year's total of $4,654,457.

Scott Paper Co.—The company has prepaid $2,000,000 in bank loans due in 1952, leaving $2,000,000 outstanding.

United Board & Carton Co.—Net profit for twenty-four weeks to November 13 was $103,394 as compared with $802,077 for the comparable period a year ago.

United Wall Paper Inc.—Net income for six months ended December 31 was $245,373 as compared with $232,196 for the same period in 1947.

West Virginia Pulp & Paper Co.—Net income for the fiscal year ended October 31 was $10,842,169 as against $10,935,424 for the preceding year.

New York Stock Exchange—Stocks

	Closing Prices Jan. 25, 1949	Dec. 31, 1948
A.P.W. Products	*4-4¼	4
Celotex	25⅛	26⅛
Same Preferred	17⅞	18
Certain-teed Products	12⅛	12¼
Champion P & F Co.	23⅛	22⅞
Same Preferred	*92-94	91½
Chesapeake Corp.	27⅝	26⅞
Container Corp.	35⅝	33⅞
Same Preferred	95⅝	95½
Continental Diamond	8⅞	8½
Crown Zellerbach	25⅝	25
Same Preferred	97¼	96
Same $4 Preferred	*96-100	95
Dixie Vortex	*28½-29-•	27
Same "A"	*50-51	50
Robert Gair	6⅜	6⅝
Same Preferred	17-17⅛	17⅛
Eastern Corp.	13⅛	13
Gaylord Container	20⅛	21⅝
International Paper	50	51⅝
Same Preferred	95½	93½
Kimberly-Clark	20⅜	20⅜
Same Preferred	*96-97½	94½
McAndrews & Forbes	36	25¼
Marathon	19⅛	20⅜
Masonite	53½	57
Mead Corp.	17	16¼
Same Preferred	*80-82	82
Same 2nd Preferred	33½	32
National Container	8⅛	9⅜
Paraffine Cos.	18⅜	19
Same Preferred	*102½-104	103½
Rayonier, Inc.	28⅜	28
Same Preferred	33⅜	32
Scott Paper	48½	47⅜
Same Preferred	*94-95½	93
St. Regis	8¼	8½
Same Preferred	*83-84½	80⅜
Sutherland Paper	35¼	32⅜
Union Bag & Paper	29⅞	30⅜
United Board & Carton	7	6½
United Wall Paper	3⅛	2⅞
Same Preferred	——	22-
U.S. Gypsum	104¼	101⅜
Same Preferred	*176½-178	173
West Va P & P	41⅛	40
Same Preferred	108½	106

New York Stock Exchange—Bonds

A.P.W. Products 5%	95⅝	——
Celotex 3¼%	101½	101⅜
Champion P & F Co 3%	100	99⅝
Mead Corp 3%	101¼	——

New York Curb Exchange—Stocks

Am Writing	5½	5⅜
Great Northern	37¼	36½
Taggart	11⅛	11⅛

*Closing Bid and Asked Prices

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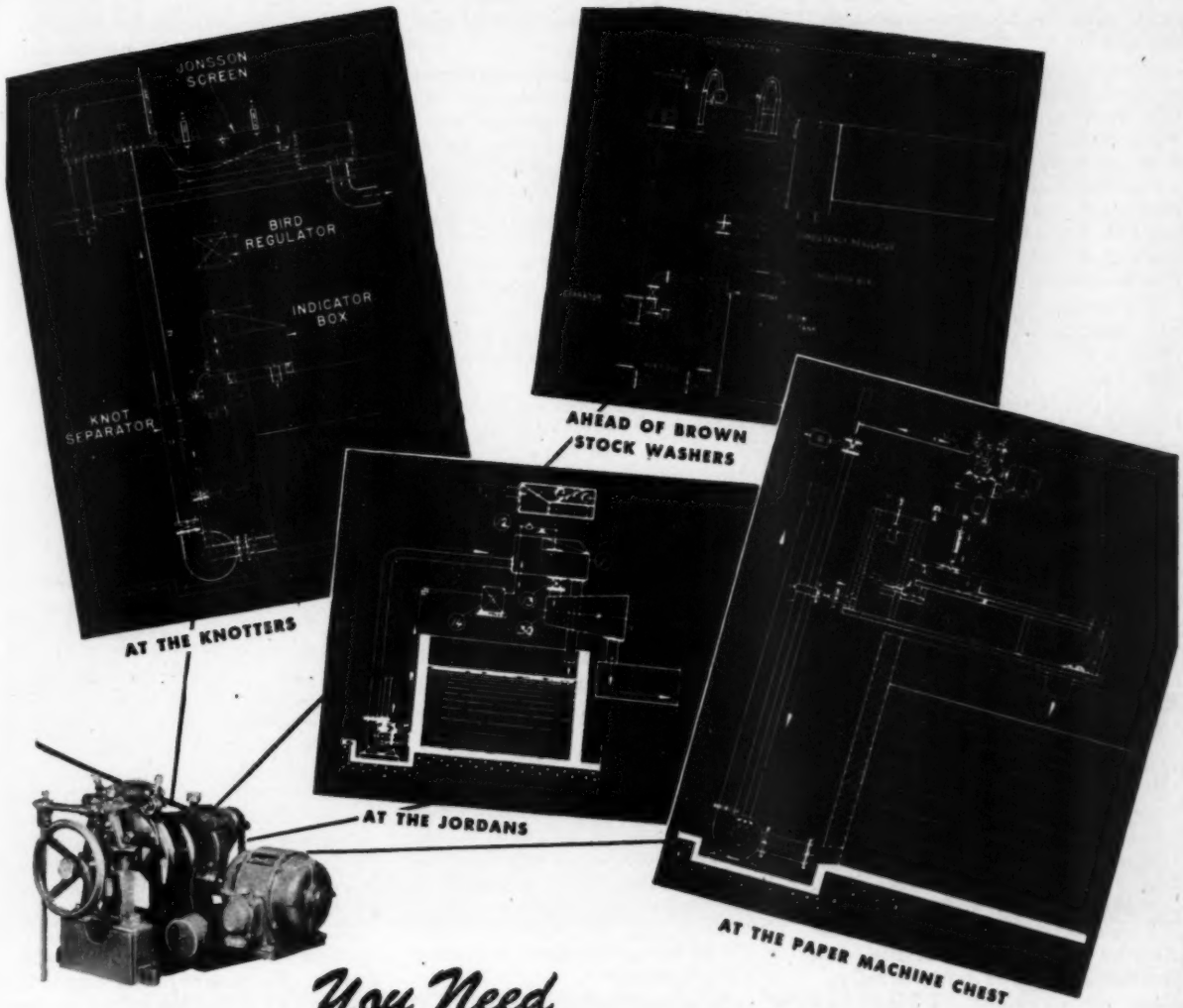
AUSTRALIAN PAPER NEWS

The rationing of newsprint was ended in Australia on January 1 of this year. In taking this step, the government was influenced by the fact that "newsprint and other kinds of printing paper of nondollar origin are becoming available in increasing quantities for the production of newspapers and can be used to supplement the available supplies of dollar newsprint and that the circumstances in which the pool was established no longer exist."

Tasmania Board Mills Ltd. is raising £500,000 by share issue to finance the establishment of pulp mills at Killsfaddy, near Tauncestion, Tasmania. A new pulp plant and board manufac-



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BIRD MACHINE COMPANY

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turing plant has been purchased from Scotland.

Thomas Owen & Company (Australia) Ltd., has given out further details about the mill it expects to establish at Burnie, Tasmania (Cf. P. I. and P. W., Oct., 1948). The mill will have a capacity of 10,000 tons of finished products per year and will manufacture vegetable parchment, greaseproof, glassine, and other specialty papers not now being made in Australia.

The new enterprise also will participate with British Coated Board and Paper Mills Ltd., Associated Pulp and Paper, and Ballarat Paper Mill Ltd. The latter mentioned company has been formed to manufacture coating papers at Ballarat, Victoria. It is estimated that the Bernie plant will reach full production within the next three years. At the outset, imported long-fibered pulp will be used. Later, local eucalyptus pulp will be utilized as far as possible, arrangements having been made to secure this material from Associated Pulp Ltd.

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FELLOWSHIPS OFFERED BY NEW YORK STATE COLLEGE OF FORESTRY, SYRACUSE

Twenty-one fellowships are offered students wishing to qualify for the Master of Forestry, Master of Science, and Doctor of Philosophy degrees, by the New York State College of Forestry at Syracuse University, Syracuse, N. Y. The announcement, which was made by Assistant Dean Hardy L. Shirley, also said that a number of industrial fellowships, special assistantships, and tuition scholarships for out of state students are also available.

Recipients of the twenty-one fellowships may specialize in forest botany, forest entomology, forest zoology, wildlife management, silviculture, forest management, forest administration, photogrammetry applied to forestry, landscape and recreational management, wood technology, forest products manufacture and utilization, pulp and paper manufacture, and wood chemistry and plastics. Receivers are required to assist in teaching and research work for a maximum of not to exceed fifteen hours per week.

Applicants must meet the standards established by the New York State College of Forestry for admission to the graduate study program, the announcement stated. Applications in all cases should be made by June 1 to Dr. Shirley, New York State College of Forestry, Syracuse 10, New York.

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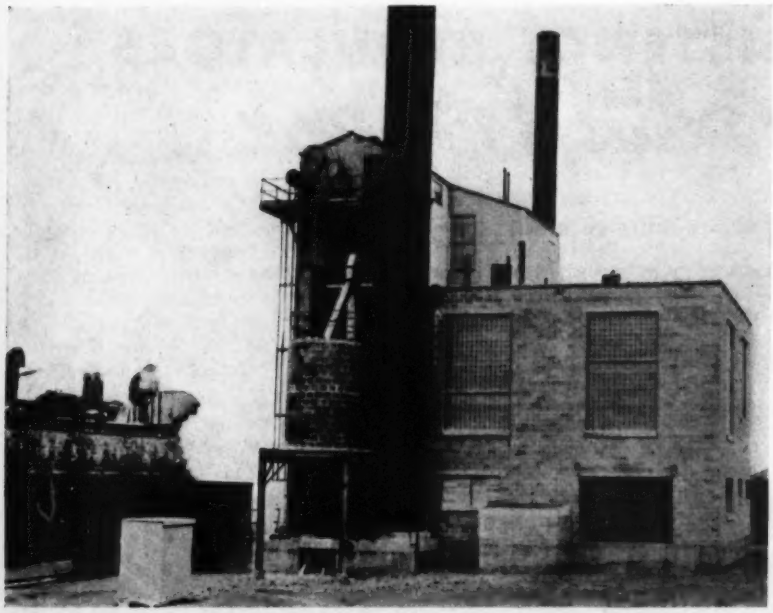
NEW BOILER HOUSE AT WARD PAPER CO. NOW COMPLETED

Construction of a new 47 ft. x 59 ft. boiler house has been completed at the Ward Paper Company, Merrill, Wisconsin, as part of the expansion and modernization program started in 1944. The new building is of concrete block and transite construction utilizing glass block. Put into operation on January 3, 1949, the two high pressure Wickes three-drum, type "A" boilers are rated at 278 hp each and designed to operate at 450 psi pressure.

Coal is handled mechanically by a Link-Belt conveyor, bucket elevator, and screw conveyor of 30 tons per hour capacity. The spreader type Detroit Roto stokers are fed by gravity from overhead coal bunkers. Ashes are handled by a Link Belt bucket elevator from the basement to the tile storage silo.

The new building is also equipped with modern locker and shower room for the employees. It replaces an old three-boiler unit in operation since 1904.



Modern boiler house now in operation at Ward Paper Company

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IMPORT NOTES

The State Department has issued an announcement that reciprocal trade agreement negotiations will be undertaken with Colombia and Liberia. It has also issued a notice listing supplementary items which will be considered in the negotiations previously announced with Italy, Sweden and Uruguay. The following items of interest to the paper industry are listed in a report by the Import Committee of the American Paper Industry:

Cigarette paper (except cork paper and cigarette paper in bobbins, or cut to cigarette size, and not including cigarette books)—The present rate of duty as fixed by the Geneva agreements is 30 per cent, but inasmuch as the duty rate on cigarette paper was 45 per cent on January 1, 1945, the tariff on cigarette paper in sheets can be reduced to 22½ per cent. This item is included in the negotiations with Italy.

Manufactures of paper—This item is included in the negotiations with Sweden. The present rate of duty is 35 per cent. It can be reduced to 17½ per cent.

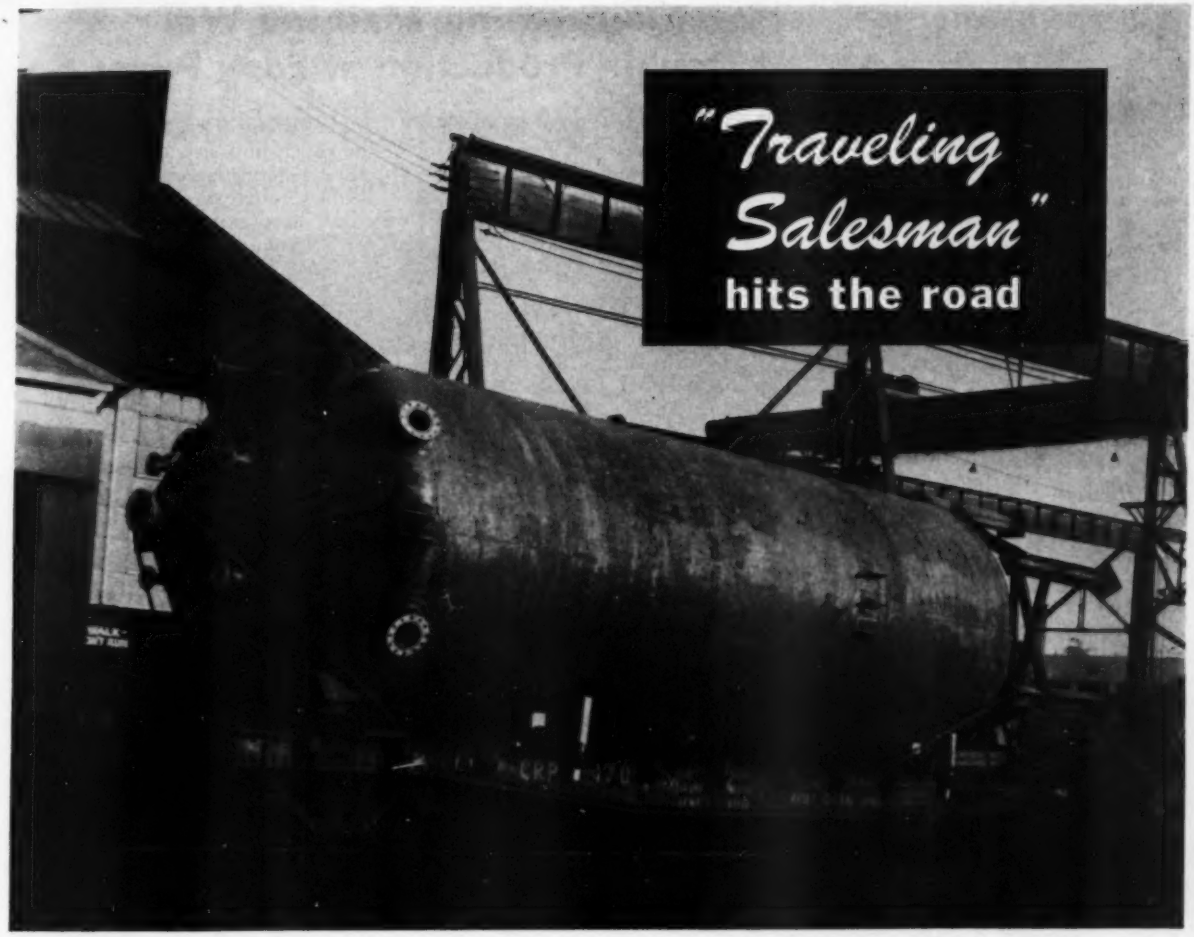
Casein—The present rate of duty is 2¾ cents per pound. It can be reduced to 1⅜ cents per pound. This item is included in the negotiations with Uruguay.

Tall Oil—This item is included in the negotiations with Sweden. The present rate of duty is 20 per cent. It can be reduced to 10 per cent.

Because of an excessive amount of chemical pulp, four carloads of Canadian printing paper for a Massachusetts newspaper have been held dutiable as dutiable printing paper, though claimed by the importer to be duty free as standard newsprint.

According to Warren B. Bullock, manager of the Import Committee of the American Paper Industry, a considerable quantity of European paper shipped to a southern newspaper has also been classified for duty, the paper in this case having an excessive amount of filler.

Seven shipments of Finnish printing paper have been held by Customs officials to have been undervalued by the



Sulphate digester heads for Southern mill

THE outstanding service record of CB&I-built pulp digesters, such as the one shown above, qualifies them as some of our best salesmen, and it's easy work for them—they have the backing of our years of experience in supplying welded steel plate structures to the pulp and paper industry.

Sulphite and sulphate digesters, spherical acid accumulators, diffusers, pulp washing tanks, flat-bottom storage tanks and elevated water tanks—all are on the list of equipment which we design, fabricate, and erect. Special non-corrosive linings are furnished when specified and x-raying and stress-relieving are done when required by the governing codes. We also build the Marx Saveall, a conical settling unit which separates pulp fibres from white water by a settling process. The fibres recovered by the saveall are returned to the beaters, and the clear water is reused or discharged to waste.

When your plans for new production or storage facilities call for steel plate work, ask our nearest office to work with you. We'll give you complete details and quotations.

The sulphate digester on the flat car, above, is 10 ft. 9 in. in diameter, by 43 ft. 4 in. long, and was shop-built in our Birmingham plant for delivery to a pulp and paper mill in the South.

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Cleveland, 15.....2267 Guildhall Building
Detroit, 26.....1566 Lafayette Building
Havana.....402 Abreu Building
Houston, 2.....2143 National Standard Building
Los Angeles, 14.....1459 Wm. Fox Building
New York, 6.....3350-165 Broadway Building
Philadelphia, 3.....1653-1700 Walnut Street Building
Salt Lake City, 1.....1577 First Security Bank Building
San Francisco, 11.....1217-22 Battery Street Building
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Tulsa, 3.....1651 Hunt Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

omission of Finnish inland freight from the declared value.

After being before the Customs Court for many years, importers of forty-four shipments of rice paper have abandoned their claim that the paper is dutiable as a vegetable product, and not dutiable, as held by Customs officials, at the higher rate of 30 per cent for paper not specially provided for. Importers of sixteen shipments of Oxford India Bible paper have abandoned their protest against the inclusion of war risk insurance in the dutiable value.

▼

ECONOMIES RESULT FROM SULPHITE GAS RECOVERY AT SOUNDVIEW PLANT

Substantial manufacturing economies have resulted from a recent installation of a new type heat and sulphur recovery system from sulphite mill blown gases at the Soundview Pulp Company's Everett, Washington, plant, the company revealed early in January. The system recovers approximately 40 lb of sulphur per ton of bleached pulp and about 950 lb of steam.

At present prices the loss from the conventional manner of blowing sulphite digester amounts to about one dollar a ton of pulp produced, it was pointed out. The recovery system also eliminates public nuisance due to discharge around the plant and is credited with increasing utilization and conservation of natural resources.

▼

SANITARY P&P CO. PHILA. BRANCH CHANGES HANDS— FORMERLY OWNED BY C-Z

The Philadelphia branch of Sanitary Products and Paper Company, formerly owned by Crown Zellerbach Corporation, has been acquired by the D. L. Ward Company, Philadelphia. With this addition, the company now controls one of the most adequate distribution centers for fine papers, industrial papers, printing papers, box coverings, wrappings, envelopes and sanitary products.

Offices and warehouse for the new division will be maintained at the old address, 600 South Delaware Avenue, Philadelphia, until further notice. All personnel will be retained.

▼

▶▶▶ NATIONAL Container Corporation announces that its wholly-owned subsidiary, National Container Corporation of Wisconsin, has leased a building in the city of Milwaukee, and will install therein machinery for the production of corrugated shipping containers.

New Corrugating Machine Will Double Production at Eddy Paper Co.

▶▶▶ INSTALLATION OF a new 105-inch Samuel Langston Company corrugating machine by the Eddy Paper Company, Three Rivers, Michigan, is expected to double that plant's production of corrugated boxboard according to George Radke, general superintendent.

The new machine will have a speed of between 400 and 500 feet per minute. The present machine is a 73-inch Langston with a slightly lower speed.

Present output of corrugated boxboard is around 40,000,000 square feet per month and will be around 80,000,000 square feet when the new machine goes into operation. The 73-inch machine is one that has been in operation for many years, having been in use more than 20 years ago when the company was located in White Pigeon, Michigan. It has subsequently been rebuilt and modernized so that it is capable of work of the highest quality according to Mr. Radke.

George Radke

Space occupied by the new machine was formerly filled by an old machine which has been dismantled.

At present the company is converting around 60,000 tons of old paper annually into both corrugated and solid fiber and there are 450 names on the payroll.

Installation of the new machine is the concluding step of an expansion and improvement program started more than a year ago. New brick single story offices have been built. The housing for the two new boilers is nearing completion. These 150-hp boilers will use crude oil and will supply all heating and steam requirements of the new installation. The company will continue to purchase its electric power.

A new cafeteria has been built, to be operated under the supervision of the Eddy Employee Benefit Association. Efficient operation of this association is indicated by the recent gift of $1,000 to the City Hospital addition fund.

The Three Rivers plant is one of six plants of the corporation, and the largest. The others are in Cedar Rapids, Iowa; Rockford, Illinois; Manitowoc, Wisconsin; Rochester, New York; Belleville, Illinois; and Detroit, Michigan. The Belleville plant is the newest and will be put into production in the early summer of 1949. Mr. Radke is general superintendent of production and labor in all the corporation's plants.

▼

INDIA WILL PLACE BIG ORDER FOR PAPER MILL MACHINERY

In a vast program of industrialization, India will spend approximately $17,000,000 for paper and pulp mill machinery in the United States in 1949, 1950, and 1951. India's total expenditures in the United States during the three-year period will total about a half billion dollars, mostly for capital

Addition to machine shop of Eddy Paper Co., Three Rivers, Mich., which will house two new boilers to supply steam to operate the company's two machines

Z-Z-Z-I-N-G

and down it goes!

. . . fast, easy and at a saving with the

DISSTON ONE-MAN CHAIN SAW

with Mercury Gasoline Engine

PLUS NEW

BOW ATTACHMENT

It's only a matter of seconds : : : about 30 to fell an 18-inch tree . . . and all this power in the hands of one man. Bucking and limbing cuts take even less time. Think what speed like this can mean to you in increased production and lower timber-cutting costs! Wherever used you can count on dependable performance, long life and low cost maintenance.

Light weight. 3½ hp. engine. Easy starting and stopping. Simple operation, all controls in one hand. Runs in any position, even upside down, without adjustment. Self-lubricating throughout. Weatherproof and dustproof. And it bears the Disston guarantee. Available in two standard guide rail lengths—18″ and 24″.

For further particulars, get in touch with your nearest Disston Chain Saw Dealer or send in coupon.

AN ACCESSORY YOU'LL WANT

New One-Man Bow Saw attachment available as an accessory. Quickly interchangeable with standard guide rails. Good for all-round cutting. No starts and stops due to pinching in the cut.

MAIL COUPON TODAY

HENRY DISSTON & SONS, INC.
264 Tacony, Philadelphia 35, Pa.

Dear Sirs: Please send me full particulars regarding the DISSTON ONE-MAN CHAIN SAW and BOW SAW ATTACHMENT.

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WHEN YOU BUY A DISSTON PRODUCT YOU BUY DISSTON STEEL SKILL and SERVICE

goods. It is claimed this should make India America's best customer less than two years after gaining her independence.

This information was contained in an exhaustive unofficial study prepared for the New York office of *The Times of India* by the Hon. Ramji Ram Saksena, Indian Counsul General in New York. This paper is the largest daily newspaper in Asia, and is part of the Bennett, Coleman chain of eight newspapers and magazines in India.

The construction of several huge hydroelectric projects which will be used to reduce the cost of power for industry, and also serve to increase India's useful acreage, are planned as part of India's industrialization.

The government of India has drastically reduced the import duty on plant machinery, and new industry has given many income tax concessions, to encourage the industrialization program, Mr. Saksena reported. Other products to be purchased by India in the United States include trucks, machine tools, electrical machinery, office machinery, railroad equipment, ships, iron and steel manufacturing plants, etc. The report states that India has the dollars with which to make those purchases in the United States.

India recently signed with the United States an agreement for mutual reduction of import tariffs on a wide margin of articles which figure in the import trade of the two countries, Mr. Saksena said.

▼

▶▶▶ UNDER THE Provisions of the new retirement plan recently adopted by Nekoosa-Edward Paper Company, Port Edwards, Wisconsin, fifty employees have been placed on the pension roster. The average period of service for the group is approximately thirty years. Heading the list of employees is William Krehnke, of the maintenance department with fifty-eight years of service, and Frank Pilot, pulp mill superintendent, with fifty-six years of continuous employment.

▼

COMPLETION OF TACOMA KRAFT MILL ANNOUNCED BY ST. REGIS PAPER CO.

The new kraft paper mill of St. Regis Paper Company, at Tacoma, Washington, has just been brought into production. This just about completes the current phase of the company's broad program of integration, modernization and expansion.

Part of the pulp manufactured by St. Regis at its Tacoma sulphate pulp mill will now be converted into paper at Tacoma and then into multiwall paper bags in the company's western factories, to meet the mounting industrial packaging needs of the Pacific Coast. To round out the integration, the company acquired during the past several years substantial timber resources in the northwestern area.

Commenced late in 1947, the new kraft paper mill at Tacoma houses a Pusey & Jones fourdrinier paper machine designed to produce multiwall kraft paper 168 inches wide at a rate of 2100 feet per minute. This represents a capacity to produce 240 tons of this type of paper every 24 hours.

In announcing the selection of Tacoma as the site for the company's eighth kraft paper mill, Roy K. Ferguson, St. Regis president, said, "The city was chosen because it offered an exceptional combination of geographical and industrial advantages which would make possible a completely integrated operation on the Pacific Coast."

Heretofore, the sulphate pulp of the company's Tacoma pulp mill has been sold as market pulp or converted at other kraft paper mills of the company. With the completion of the new paper mill, part of the pulp will be converted at Tacoma, with the balance still available for the company's pulp customers.

Washington News

RE-ENACTMENT OF OLD RECIPROCAL TRADE ACT SOUGHT BY HOUSE COMM.

The Ways and Means Committee of the House of Representatives has completed hearings on the Administration proposals for a reenactment of the old Reciprocal Trade Agreement Act and the repeal of the present Act which requires a scientific study of economic conditions by the United States Tariff Commission.

Under the existing law the Tariff Commission is required to report to the President the peril point below which no duty rate can be cut without injury to domestic industry. This provision was savagely attacked as a crippling of the reciprocity policy by Administration proponents of the old Hull program of trade agreement negotiation. The pressure is so great that scant courtesy has been given to the domestic industries which wished to record their opposition to the elimination of scientific study of tariff rate making. This attitude, however, is not only evident in the tariff revision field, but is manifested in the case of other administration sponsored legislation.

It is reported that no hearings whatever will be held on the proposal to substitute 75 cents per hour for the present 40 cent minimum wage basis. When the Taft-Hartley labor act comes up for hearings it is expected that the heavy Democratic majority in the committees to consider changes in the legislation will grant little time to the supporters of the present law, but will as in the case of the trade agreement legislation grant all the time desired to those favoring the legislation.

Whether the Taft-Hartley Act will be repealed and new sections written into the renewed Wagner Act is not yet announced. Labor is asking this procedure so that they can secure the repeal of the existing law and then concentrate against any proposed changes in the original Wagner Act.

N. Y. REPORTS INDICATE LOWER OUTPUT OF PAPER AND BOARD THIS YEAR

New York reports are that the total output of the paper and paperboard industry will fall about 250,000 tons in 1949 as compared with 1948 production. The development of a buyers' market is causing several companies, according to these reports, to discontinue operations in certain marginal mills in order to operate only their lower cost plants. How much of the repeated reports of a change in the market situation are due to pressure from consumers is hard to say, but Department of Commerce summaries seem to indicate that supply is now somewhat ahead of demand.

In some parts of the country, mills are no longer operating at the rate of production which marked 1948. This is particularly true in the writing paper and converting book paper fields, where some sporadic curtailment of operations has become manifest.

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BRITISH PAPER NOTES (December, 1948)

▶▶▶ Conditions in the British Paper Trade at the close of the year were considerably improved, as compared with those operating at the beginning of 1948. In January the supplies of paper were extremely short, owing mainly to lack of raw materials, which was due to the prolonged drought experienced during the previous two seasons in Scandinavia. As the year closed, there was some appearance of paper supplies gradually returning to normal, although they were still a long way from prewar standards. Actually production was operating at 75 per cent of 1938, and to reach full prewar output will doubtless be a slow process, unless materials arrive from Scandinavia and North America quicker and in greater quantities than at present.

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Assures EFFICIENCY
IN POWER PIPING
OF EVERY TYPE AND MATERIAL
Dependability, the essential quality in any efficient piping installation, is built-in when the system is prefabricated by Pittsburgh Piping and Equipment Company.
In P.P.&E. shops, sub-assemblies are expertly fabricated, using every modern facility for metallurgy, bending, Van Stoning, machining, heat-treating, stress-relieving, and pressure-testing.
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Heights State Bank Bldg., Houston
Whitehead Building, Atlanta

Perhaps the two most important features of 1948 have been the price position and the change in the general situation of newsprint. Whereas the year opened with a general advance in prices of practically all grades of paper (newsprint for example touched £46-10-0 per long ton, and a little later in the year there were additional price advances, particularly among wrappings and mechanical papers), just before the last quarter of the year a series of price declines came into operation.

These price movements coincided with the permitted production of the various grades of paper, which declined in the early months but improved as the year progressed. Similarly, as the months passed, the pressure on paper supplies became a little less heavy, and included in this tendency was the general reaction of the export market which became increasingly difficult.

Permitted production of newsprint at the beginning of the year was only 20 per cent of prewar, but when the healthier material supply position became effective, this percentage was gradually raised until it reached 45 per cent. Rumors are already circulating that this production may be moved up to 50 or even 55 per cent in the near future, and as the British newsprint production was in the region of 800,000 tons annually, it will be seen that the advance from 20 to 45 per cent completely changed the newsprint supply position.

Despite the many difficulties under which the British Paper Trade is still operating, makers generally are endeavoring to return to their old standards and comprehensive range of qualities. Particularly is this the case with cover and tinted series and tinted arts; also creamy, toned, and matt coated qualities, which have been out of production since 1939 and are once again in occasional request.

Unhappily, what was once an important item in any review of the year is now absent. We refer to news concerning improvements at many of the mills, the laying down of new machines, or replacements of old machines. Doubtless many minor improvements have been effected aiming at greater and better production, but the need is urgent for bringing the mills up-to-date. Government permission has to be obtained for the necessary steel and other materials, and if the Trade is to continue to reach the export target set for it by the government, then the furnishing of these materials becomes a matter of importance.

The immediate prospects for the British Paper Trade in the early months of 1949 are considerably brighter than a year ago, but at the moment there is no feeling of optimism concerning the future, rather one of quiet hopefulness. Talks with Sweden and Norway have produced promises of increased supplies of pulp, and, from the former, additional newsprint, but generally the Trade is waiting for further moves from the Paper Control, the chief of these being increased permitted consumption quotas accompanied by additional material supplies to the mills.

That there is scope for these additional materials is shown by the Board of Trade figures covering the months January-November. Imports of these materials to date are 1,408,947 tons, actually 332,584 tons in excess of 1947. Of this excess, chemical wood pulp is responsible for approximately 115,000 tons, mechanical pulp nearly 24,000 tons and the balance is esparto grass with a little extra rags. Receipts from Canada are up by approximately 42,000 tons, from Finland 76,300 tons, from Sweden 42,400 tons, and Norway nearly 66,000 tons. Incidentally, Canada is at present sending nearly three times the materials forwarded in 1938, and Newfoundland's comparative figures are 1,378 and 37,685 tons. Paper and board exports to date are 6,655 tons higher than in 1947 with a total of 119,706 tons; coated papers and boards are running at 186 per cent of last year; and of all countries which have taken extra supplies from Great Britain, the most spectacular is the U.S.A., where the respective totals for the eleven months periods of 1938, 1947, and 1948 are 1,098, 1,881, and 10,363 tons. Imports of paper and boards, 464,711 tons, are a little lighter than in 1947, although the U. S. A. has managed to increase their total from 24,125 to 28,864 tons.

Well-Equipped Medical Center Completed at Mersey Paper Co.

▶▶▶ In accordance with a general improvement program being carried out at the Brooklyn, Nova Scotia, plant of the Mersey Company, construction of a completely equipped medical center has recently been finished. A registered nurse, having special training in industrial work, is in attendance.

Additional space is being prepared on the second floor of the mill for the main laboratory and general plant control facilities. Plans include a chemistry laboratory, storeroom, darkroom, a library, offices for the general superintendent and staff, and a superintendent's meeting room.

The mill's two newsprint machines are now turning out 390 tons each day, although they were designed to produce but 250 tons daily. This step-up has been accomplished by additional grinders which have been added, and the screening system has been greatly improved by the addition of the new Cowan screens for screening both groundwood and sulphite pulps. Both paper machines have been equipped with modernized electric drives, capable of attaining speeds of 1500 fpm. This increased speed will be used as soon as the present improvement program is completed.

An addition to the paper storage shed was completed in 1940, doubling the original capacity to 10,000 tons. The newsprint roll conveyor runs down the center of this building with two 1½ ton cranes on either side. Roll-up doors lead directly to the wharf for both railway car and ship loading.

About 95 per cent of the mill's output goes to foreign markets, the remainder to Nova Scotia markets. The company's ship *Markland* is now carrying two cargoes of newsprint per month between the mill and eastern United States ports. Two other ships carry newsprint to New Zealand and other foreign and domestic ports, as well as carrying miscellaneous cargoes of coal, pulpwood and other items.

Two years ago, the company inaugurated a pension scheme for both past and future service. A group insurance plan and a hospital plan are operating under the auspices of the local labor unions. A mutual interest board, composed of representatives of each department of the mill and the company executives, meets regularly to discuss safety and other matters of mutual interest.

The company was organized in 1927, and construction of the mill was completed and the first newsprint produced in 1929. It owns timber limits amounting to 663 square miles, but the present annual requirement of about 140,000 cords is largely met by purchases from owners of farm woodlots throughout Nova Scotia.

Production records at the Mersey Paper Company Ltd. plant at Liverpool, Nova Scotia, were broken recently when a disastrous flash fire caused heavy damage to the mill's No. 1 paper machine. The fire broke out near the dryer hood at the wet end of the machine and quickly spread to the dry end, destroying valuable dryer felts and delicately-machined rolls.

Company officials said the fire would not greatly affect the company's newsprint deliveries, nor would it result in a large layoff of personnel.

UNION PACIFIC

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To American Industry:

Oregon's industrial payroll has doubled since 1940 and her population has increased 49 per cent. New abundant supplies of America's lowest cost electric power serve Oregon industries and can be increased—up to 1000 per cent more—through the continued development of the Columbia River and its tributaries.

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And Oregon is a great place in which to live!

Very truly yours,
Douglas McKay
Governor

Douglas McKay

One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

When selecting sites and seeking new markets in Oregon, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Utah, Washington, Wyoming . . . address Industrial Department, Union Pacific Railroad Omaha 2, Nebraska

UNION PACIFIC RAILROAD

Road of the Streamliners

This man is adding Extra Value to your E-M Heavy-Duty SQUIRREL-CAGE Induction Motor!

Stator coil insulation is built up step-by-step to seal the winding while insulating it. Repeated taping, dipping and baking is shown diagrammatically by the cutaway drawing.

● Expert craftsmanship added to careful design makes coil insulation a dependable component of an E-M Induction Motor.

Built up step-by-step, with multiple layers of high dielectric tape, coils for E-M Induction Motors are sealed as they are insulated. Each layer of tape is impregnated with a tough insulating compound. Each is tightly wrapped, treated with bonding varnish, and then given a controlled baking in an electric oven. Throughout the length of the coil each layer is homogeneous—eliminating weak spots which occur at the joints of sheet insulation and tape insulation.

The completed E-M coil is slightly pliable—a quality it retains through long years of service. This pliability is particularly needed on reciprocating loads such as compressors, where reversing stresses would otherwise break the insulation.

For special applications, such as boiler rooms, the sealed E-M coil is made even more perfectly moisture-resistant by additional processing.

Two other protection points are: *First*—tight coil lashing to a strong end ring, which minimizes movement even under the high stresses of starting. *Second*—a uniform flow of ventilating air around the coils is assured by ingenious design of the rotor and stator core.

LET US TELL YOU more about "Big Motor" engineering. You notice the difference—in rotor construction, in the cool-running wear-resistant bearings and the motor protection of E-M Heavy-Duty Induction Motors, as well as their long life insulation. These are the differences put into E-M Motors by the men who design them and make them.

Write for full data in our publications 189,190.

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Types of E-M SQUIRREL-CAGE INDUCTION MOTORS

2-pole; drip-proof; ring lubricated bearings.

2-pole; drip-proof; pressure-lubricated bearings.

Four or more poles; drip-proof; sleeve bearings.

Four or more poles; splash-proof; ball bearings.

BETWEEN THE LINES

Traditionally Speaking . . .

▸▸▸ ODDLY ENOUGH, the shortest month of the year brings two birthdays that are observed nationally. On these occasions we revive the great deeds of Washington and the memorable sayings of Lincoln. It is beyond our wildest fancies to imagine that the time might come when Americans would cease this practice. Our nation is founded on deeds and writings of stalwart pioneers and great statesmen and should the time come when any kind of a "deal" would wipe out these traditions, that day this country would cease to be "America the Beautiful."

Tradition—quote, is one of the most cherished and most dangerous possessions of the human race, unquote. Now and then I like to take a refresher with the documents which form the basic laws of our country, and while browsing through these recently I was struck with a passage from the Declaration of Independence that had escaped my memory. Here it is: "Prudence indeed will dictate that governments long established should not be changed for light and transient causes, and accordingly all experience hath shown that mankind are more disposed to suffer while evils are sufferable than to right themselves by abolishing the forms to which they are accustomed." Whether or not this passage might be said to have been prophetic depends entirely upon each individual's viewpoint and his interpretation of what are "sufferable evils."

There can be no question but that government must dress according to the period, just as men no longer wear velvet breeches, lace frills or "buttons and bows." And, try as they may (and did), the dress designers found it a losing business matter when they tried to bring back grandmother's bustle. Who knows but that the styles of those times may have been viewed as "sufable evils" by the children and grandchildren?

Even though we do dress differently and live in smaller homes that have every convenience, and some luxuries; even though we adjust our thinking to an acceptance of many new ideas that belong to our modern world, we must be honest with ourselves and never waver from fundamental principles that underlie the foundation of our national home.

The Art of Humanics

A man in public life recently commented on a painting claimed to be the outstanding art work of the past year. This painting, titled "Vanity Fair," depicts our present times; it shows human beings expressing pleasure, sorrow, unrest—all of the emotions that emote from man. In the foreground is a person about to be murdered by a comrade, but those around them pay no attention—no one moves to prevent the crime.

A fantasy of art, you say? Perhaps it is, though life is believed to be very real. But will anyone accept the picture described as true, humanically speaking? Is there not rather a complete reversal of the true verities of the soul? Yes, I know, we often misjudge our fellowmen and take refuge behind that old question "Am I my brother's keeper?" Nevertheless, I am sure not one person who reads this page has failed to send out a thought of cheer and "Bless you," for the heroic rescue work going on throughout the great plains and isolated mountain areas of our nation. The air waves, the pages of the big dailies and reports of unknown origin all send out an SOS from people caught away from home in the throes of a severe, almost unparalleled winter, that has brought starvation to domestic and wild animals that normally roam the range for food.

Army and Navy planes have done a life-saving job in carrying supplies and food; a girl flyer piloted her plane alone dropping supplies and food to people she knew to be in distress. No one can say that these people walked around the red flare in the road, saying to themselves "It's none of my business."

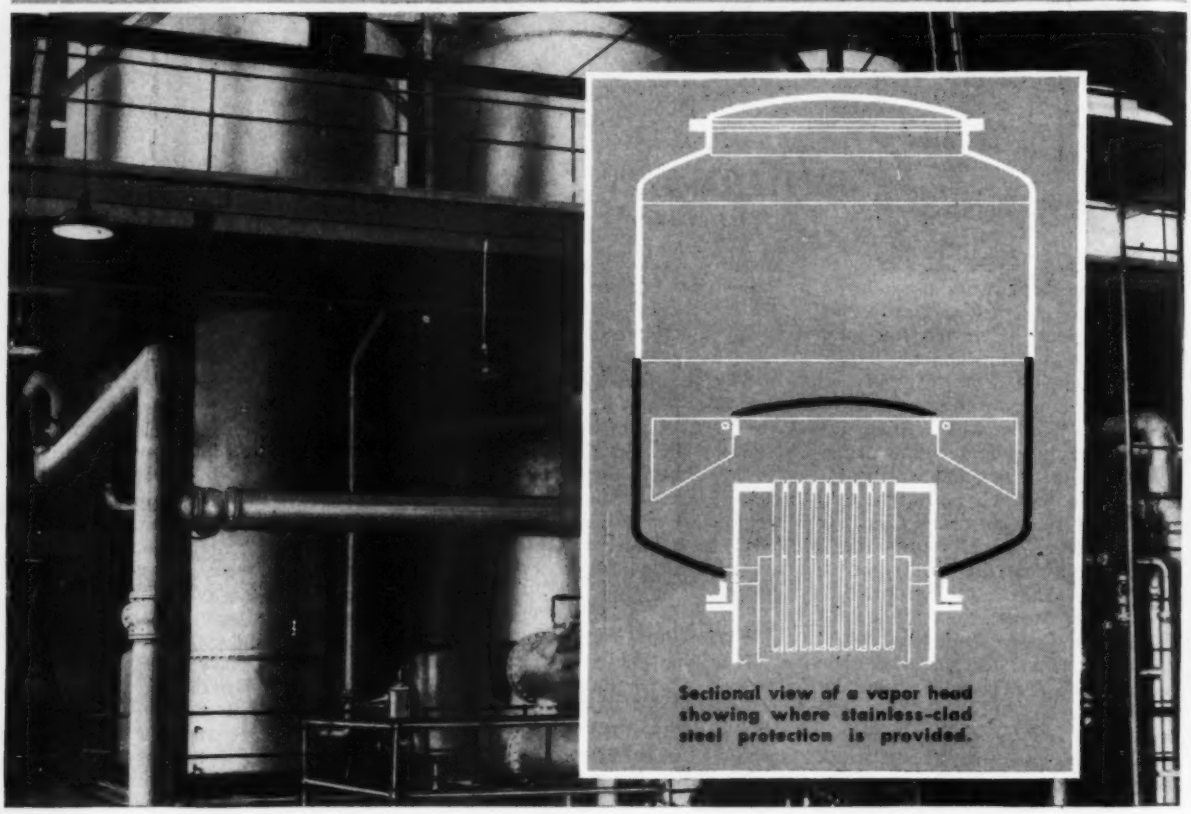
GIVE
THRU RED CROSS

▸▸▸ ONE MAN in public life spoke a veritable truth when he said that those who wail the loudest about communism and cry for laws and legislation to stop its march, do nothing about it in their own circles. They do nothing to further the cause of christianity which is the cornerstone of America. This speaker affirmed, with special emphasis, that a sweeping force behind our spiritual structure will destroy communism—he said he was certain that is the only antidote that can be completely effective. And, he added, it will never be subject to the vagaries of the political party in power.

—by Bessemer

WHEN THE GOING GETS SEVERE,

Swenson Evaporators use Clad Steel



Because black liquor gets corrosive as it becomes more concentrated, Lukens Stainless-Clad Steel is used in the first effect and quite often in the second effect.

Ordinary steel faces no corrosion problem in the latter effects of processing in Swenson evaporators. But in the first effect, when the black liquor has become concentrated, corrosive conditions are severe. That's why the vapor head is stainless-clad steel.

Lukens Stainless-Clad Steel provides corrosion protection. A uniform cladding of this corrosion-resistant metal, usually 10% or 20% of the total plate thickness, is permanently bonded to the steel backing plate, offering protection that's equivalent to *solid* stainless steel at the lower cost of *clad* steel.

Other Swenson process equipment uses other Lukens Clad Steels, according to the character of the corrosion they encounter.

Lukens makes Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad Steels in plates as wide as 178 inches, or to over 3 inches thick—available in the extra smooth, easy-to-clean sodium hydride finish. Bulletins 255 and 338 tell you all about them. For copies, or for help in solving your corrosion problems, write Lukens Steel Company, 408 Lukens Building, Coatesville, Pennsylvania.

CLAD METAL STEEL

LUKENS

Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS

Two 16mm Kodachrome motion pictures—"The Manufacture of Lukens Clad Steels" (silent) and "Solving Corrosion Problems" (with sound)—will be loaned to you. Write for booking date.

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

THE PAPER INDUSTRY
and PAPER WORLD
FEBRUARY 1949

Forty-five year old Lee Paper Company, of Vicksburg, Michigan, expands and modernizes

Gordon Moore examines rag stock in beater installed early in the war

New fourdrinier wet ends on both machines with new press section and additional dryers on No. 1

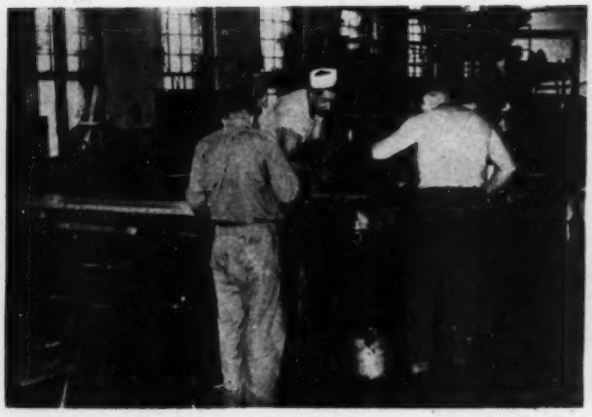
Michigan Mill Modernizes

Only ten days down time to completely replace a fourdrinier wet end; **only twenty-eight days** down time to install a new fourdrinier, new press section and additional dryers; one week to tear out and completely rebuild the machine room roof. Impossible? No. The author tells of the planning, the engineering and the careful preparation that made this job click at the Lee Paper Company. He tells how the close co-operation of management and labor, and of machinery builder and manufacturer, helped make this major rebuilding job a success in record time.

GORDON MOORE
Lee Paper Company

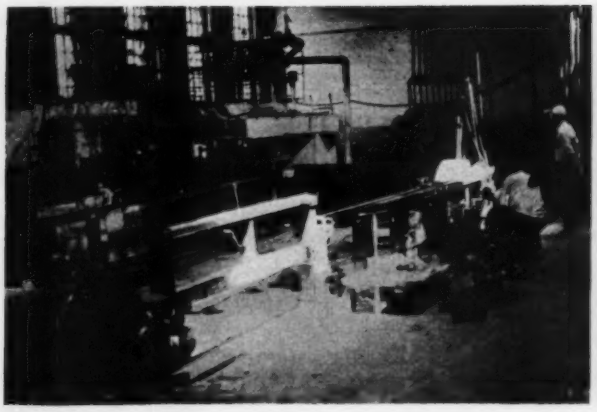
▶▶▶ IN 1945, it was decided to replace both of the original fourdriniers, one press section, and to add to the drying capacity of both machines. In order to arrive at the right design for this equipment, many visits and conferences were held between the machinery builder's engineering staff (The Black-Clawson Company) and the mill officials and engineers. Studies were made; needs were investigated, and several

No. 2 Machine—rebuilt in ten days...

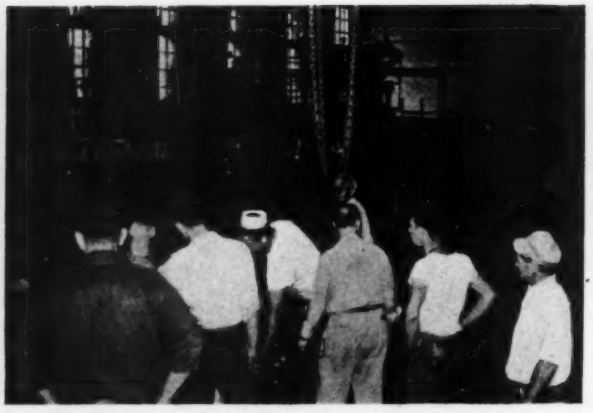


1 Dismantling old wet end

2 Breaking concrete for new fourdrinier pit



3 Erecting new fourdrinier



4 Making paper again

layouts were made before we settled on what was most desirable. Inasmuch as the job consisted of replacement and addition, rather than completely new machines, successfully dovetailing into existing machinery constituted problem number one. We wanted additional drying capacity. The machine room being just so long with a fire-wall on each end, necessitated our going both above and below with additional dryers. This meant overhead crane clearances to be considered as well as creating space in the basement with supporting framework for felt rolls and dryers.

Innumerable Changes

The main beams, with bedplates would have to be extended as far as the limits of the room would permit—about 15 feet additional. To adequately support the extension with its additional load, we subsequently cut into the fire-wall and last two columns and effected the span with two 14-inch "H" beams weighing 167 pounds to the foot.

After the final design of the equipment was determined, the Black-Clawson engineers went over the mill with us, explaining in detail the changes we would have to make to be ready for the changeover and to minimize down time. Many of these changes had to be made while the mill was running. Periodic week-end shutdowns had to take care of the rest.

The changes mentioned above were many and some of considerable scope. Existing piping in the basement had to be re-routed to make way for extended pits and machinery. This could be done on down time only. If replacements were made in regular maintenance, they were done to fit the future setup. Much new piping was roughed in.

Considerable new wiring and rewiring had to be done. Complicated control panels called for a maze of wires, to the drives in the basement and to control stations in the machine room.

Existing belt drives from the line shaft in the basement would have to be completely changed. Of course, this could not be done until the final shutdown, but we did put in new columns where needed to support the bearings and shafting for the new alignment.

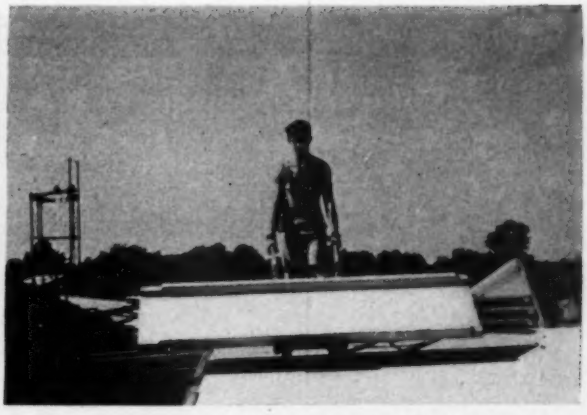
New Roof Needed

Furthermore, it became apparent that we would have to replace the machine room roof. The roof had been on for about twenty years and typical of wood roofs in machine rooms, when they start to rot, they go fast. This was in the middle of the winter and the shut down was due in July. We patched it up and crossed our fingers. Materials were ordered for a new roof. Since the old wood decking had to be removed, a job of considerable magnitude, which we had not heretofore considered, developed.

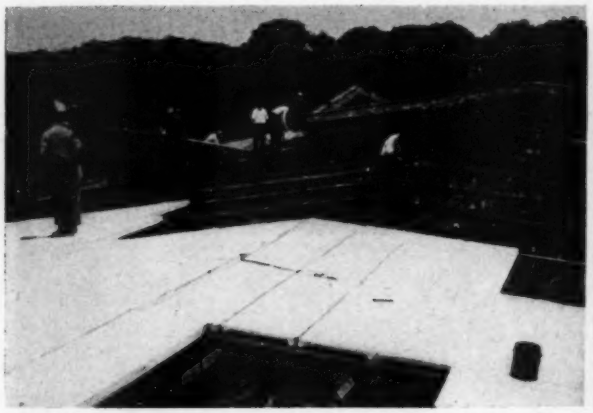
The sprinkler system and the steam heating lines, with about 2000 various sized hangers were suspended from the wood roof decking. Our problem was to resuspend them from the steel roof trusses without taking them down.

Replacing Machine Room Roof...

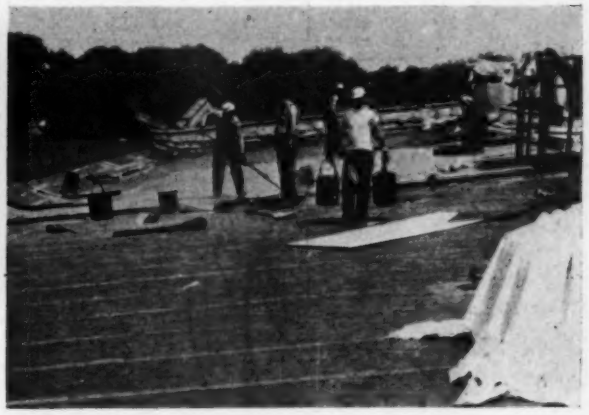
1 Tearing off old roof



2 Precast concrete slabs replace wood



3 Old nearly off—new being laid



4 Finishing the roof surface

New hangers were bought and hanger rods made. The big problem was whether to drill holes for bolts or weld the hangers onto the trusses. We did neither. Instead we procured a tool (made by Stemco Corporation, Rocky River, Ohio), somewhat on the order of a pistol, which drives a threaded stud into steel by means of a blank powder charge. We used the .22 calibre size for our job.

This method saved us time at a 4 to 1 ratio over any other means we could think of for doing this job. Once the stud was fired into the truss, the hanger rod eye was slipped over it and a nut turned on. Then the hanger (split type) was placed over the pipe and clamped. As the new hangers were installed, the old ones were taken down. This job had to be done on regular maintenance shutdowns as it was too hot to work up near the roof while the machines were making paper.

The roofing engineers recommended four lateral lines of tierods, running the length of the machine room, to give the roof trusses greater lateral stability and strength. The tierods were made of ⅝-inch round bar, nine feet long, threaded on each end. Of course, we had many hundred holes to put through the gusset plates of the trusses. We purchased a portable punch which two men could operate quite easily and did the job in excellent time. The rods were inserted and nuts drawn up on each end. When these two jobs were completed we were ready to go ahead with the old roof removal and new installation, come the shutdown.

Final Preparations

Some months before the delivery date of the machines we realized that this equipment would have to come into the mill through a larger opening than we had. Furthermore, it would have to be brought up one story higher than ground level. Our answer was to choose a centrally located area and put in an opening twelve feet square. Through this opening and spanning the railroad track overhead, we constructed a monorail upon which we hung twin, five-ton, geared trolley hoists. This installation enabled us to pick up equipment from a car or the ground outside and set it down inside on the second floor level.

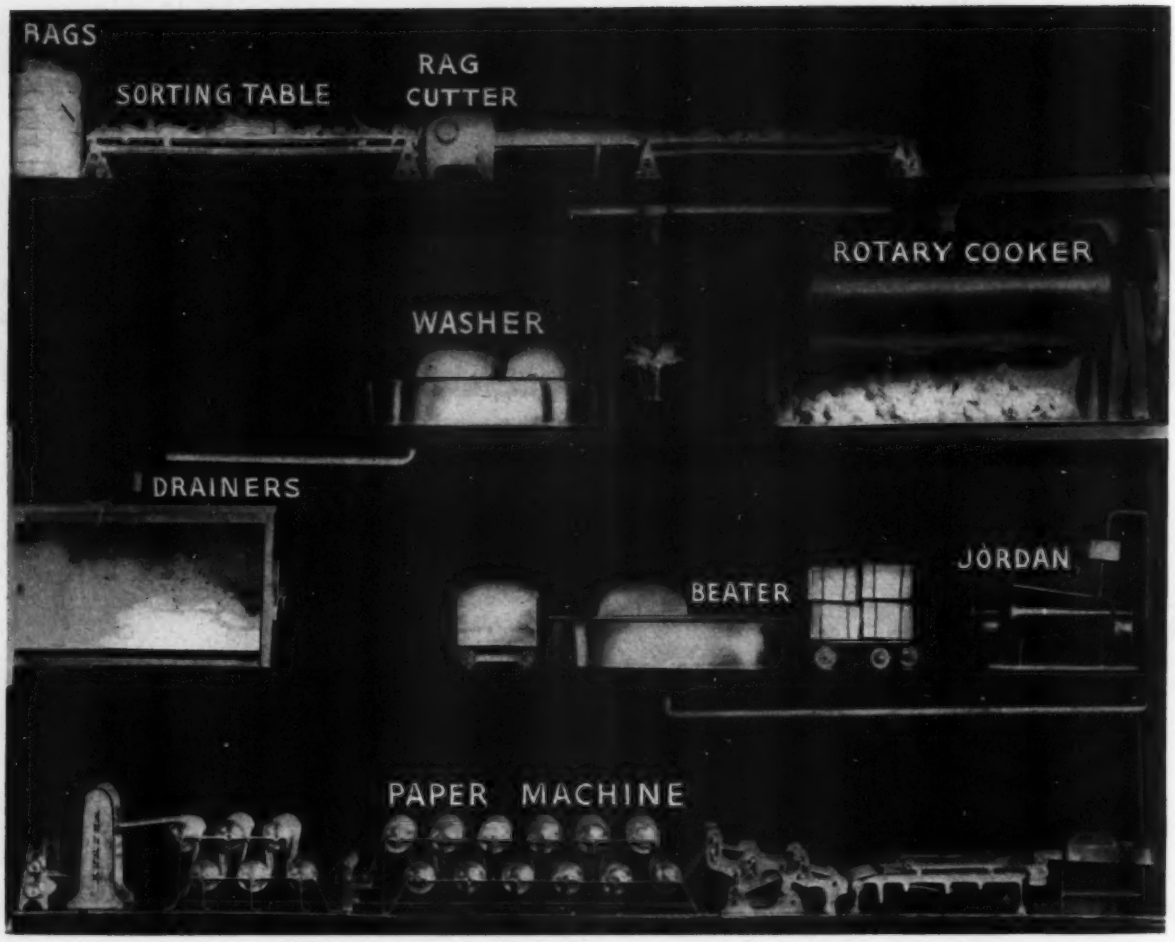
The installation mentioned above was simply one of many made to expedite the erection of the machines in the quickest possible time once we shut down. Every hour those machines were down meant no income for the mill. Every foreman and man knew this. The closer D-day approached, the more all activity centered around final preparation for the shutdown.

About a month before the shutdown, the machines started rolling in by freight car. The disassembled parts were stored, as nearly as possible, in the order they would be used.

The Big Push

The mill shut down the evening before the Fourth of July. Work started the sixth. The week before, we tore

How Rag Paper Is Made...



Lee Paper Company built this model for exhibit purposes about 10 years ago. While improvements have been effected, the process remains essentially the same.

The present modernization program dates back to 1933 when a start was made in replacing the original six small boilers and seven reciprocating steam engines with modern power plant equipment. Installation of modern beaters began in 1941. In addition to rebuilding the paper machines and machine room roof, new finishing equipment has also been installed.

out two bays of roof decking so the roofers would have a place to start. We crossed our fingers, hoping it would not rain. It rained—cats and dogs! But the boys in the machine room continued to make paper anyway. The roof was open on the dry end and tarpaulin gave enough shelter to keep the rain off the winder sections.

Our plans called for the removal of No. 2 fourdrinier and installation of the new one first. We wanted No. 2 back on production just as soon as possible.

The Fourth of July came on Sunday, but would be celebrated on Monday. Sunday the maintenance crew tore out No. 2 fourdrinier and moved the screens out.

Tuesday all hands turned to. Except for the roofers and a contract pipe fitting job, all labor came from our mill. There was a gang upon the roof tearing off roof decking and cleaning and painting the trusses. Their job was to stay ahead of the roofers. There was a gang on the ground clearing away debris as it came down. There was a gang inside taking out ducting and old machine hoods. Once the roof was completed, we figured it was the time to paint the machine room. A gang was breaking and hauling out cement for the new fourdrinier pits. There were several pipe fitting gangs at work on a number of jobs.

Incidentally, to pipe up a paper machine it takes ten separate types of piping, water lines, steam lines, vacuum lines, air pressure lines, chemical lines, stock lines, sizing lines, sewage lines, electrical lines and oil lines. The wiring and electrical equipment gang was all over the place. Three gangs were working upon new equipment. One gang was cleaning it, another hauling it in and another starting assembly. There was a gang removing the old equipment from the basement. Carpenters followed up the cement breakers, handling the miscellaneous jobs preparatory to pouring concrete.

To the uninitiated, the machine room was a maelstrom of confusion and noise. Air hammers and dust below, lumber being ripped off above, chipping hammers on steel, the pounding of carpenters, all punctuated with the shouting of men, gave a bizarre aspect to the whole room.

By the end of the week the new roof was on. Wood decking was not used on the roof this time. Instead, we used

a precast, reinforced concrete slab. On top of the slab, we laid a two-inch foam glass covering. Then on top of all went a regular built-up, four-ply roof. We went to this expense to combat condensation on the underside of the roof during winter months. Up to date, the results are encouraging.

At the end of ten days, No. 2 was rolling again. In the meantime, the room had been cleaned and painted. No. 1 machine fourdrinier was out and cementbreaking was well along. No. 1 was a much bigger job than No. 2. Starting at the wet end of No. 1 the leads had to be changed and new fourdrinier and press section put in. The drying capacity being increased necessitated breaking the existing first dryer section in two and installing a completely new section between and then joining all sections. With the exception of the screens every bit of No. 1 had to be moved. Briefly, here is the way we accomplished it.

Rebuilding No. 1 Machine

The engineers ran a piano wire center line the full length of the machine room, just under the bottom side of the roof trusses. A paper machine must be lined up. There is no middle course. A sheet entering the press section or first dryer section, one-fourth inch off, will wander off the edge of the dryers. Such an error will express itself in feet by the time it reaches the calender stack.

The winder section was first located and lined up. This meant moving it about 15 feet. In no case were these sections disassembled. The anchor bolts were removed and the bed plates cleaned, buffed and greased. Jacks were then used to break the sections loose from the bed plates. Hoists, placed in a horizontal position over each bed plate enabled the sections to be slid with relative ease.

The reel stands followed the winder section. Then in turn came the stack, last dryer section, size section and successive dryer sections. A series of plumb bobs were suspended from the centerline overhead. These could be slid along the piano wire at our convenience to approximately the position required for the section being worked upon. After the centerline of the machine was determined, this point was brought into pinpoint contact with the plumb bob.

Positions previously scratched upon the bed plates determined where the machine should rest for squareness. When these three points were right, the section was leveled. The most important of the above is that the machine be correctly aligned for squareness in its component sections. Black-Clawson engineers checked and rechecked these measurements before the go-ahead was given for drilling, tapping and bolting down the sections.

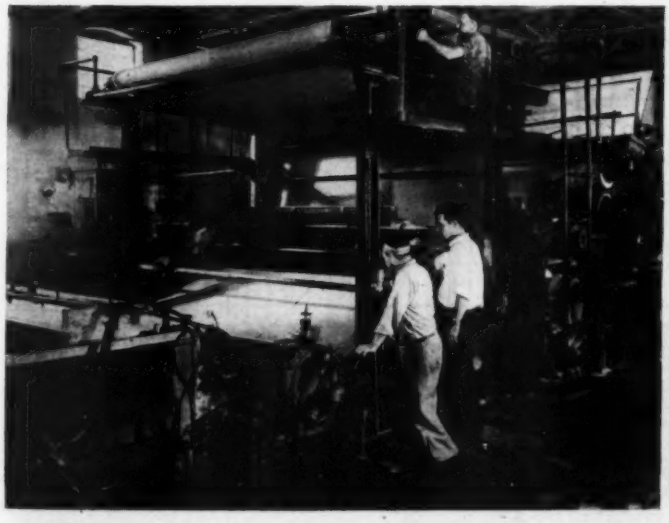
New drives had to be installed the full length of the machine. These had to be lined up with the machine as well as with the new line shaft going into place in the basement. Some framework and dryers which had to be placed on top of the machine required more head room than our crane could give us. In these instances special rigging was necessary.

One way or another it was done. Each day saw additional pieces fit into the jigsaw puzzle. Split cone pulleys were slipped into position on the line shaft and belts put on. The maze of wiring was finally tied up with control panels, motors, breakers, control stations and switches. Finally, we were ready to turn her over. Tests were made at increasingly faster speeds until the engineers were satisfied. The wire was put on and machine clothing slipped on the press and dryer sections. Paper stock flowed on to the wire 18 days from the start on No. 2, twenty-eight days after the shutdown. It took about two days to shake her down for production. When the first sheet was taken over the machine, it was understandable that nearly everyone in the mill was standing by to watch the event. A great amount of hard work had been completed and every man concerned was justifiably proud of the job.

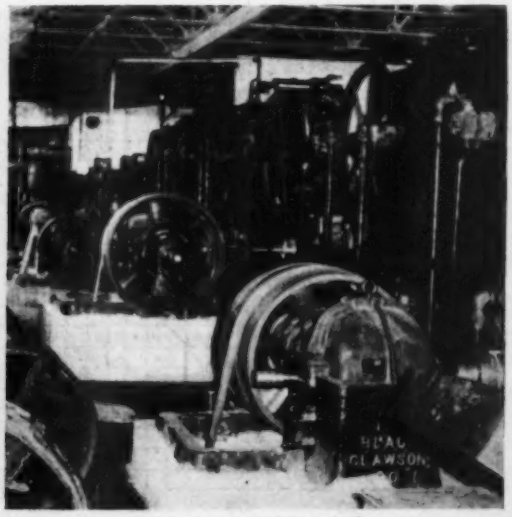
Perfect Safety Record

One thing not mentioned so far was the safety record for this period. Men were called into meetings before the shutdown and our chances of coming out of this job without lost-time accidents were outlined in very plain language. We expected some and even saw the possibility of a fatality. Men who normally do not walk six-inch trusses 40 feet in the air, or work around heavy machinery installation or as riggers, are placed at a disadvantage if every precaution is not taken. After both machines were again making paper, one can imagine our relief and happiness to find no lost-time accident had occurred. True enough, our nurse was busy taking care of cuts, bruises, slivers, etc., but that bad accident never did happen.

Now some five months later we find there is still much work to be done. Little details and post shakedown kinks must be removed. They are not serious, but still require attention.



Ned Ryder, machine tender, and Ralph Atkins, superintendent, in front of new press section on No. 1 machine



Complete new drive on No. 1 machine makes for smooth operation and ease of control

What Size Rotary Kiln?

RALPH GIBBS, Consulting Chemical Engineer

▶▶▶ BEFORE EVERY ROTARY kiln is installed, the question titling this article is asked. Today's technical or engineering literature affords little help in answering the question. Consequently, many purchasers of rotary kilns rely only on the manufacturer to suggest a size of kiln considered adequate for the purpose.

Many factors enter into the establishment of the proper size of a rotary kiln. However, there seems to be no general agreement as to what these factors are. Consequently, in the industries using rotary kilns, there are today a conglomeration of rotary kiln sizes to perform almost identical tasks, resulting in considerable confusion to one making a study of the matter.

The most economical size of rotary kiln will be determined by such factors as: first cost, maintenance, power consumption, fuel consumption, etc. Except for special conditions, there should be little difference in kiln sizes to perform the same job. However, unless the local conditions are drastically different from normal conditions, the ultimate optimum kiln size selected should be quite uniform to do the same type of job.

Fundamental Rotary Kiln Relations

The fundamental formula relating the size of the kiln to its normal production rate is:

$$T_d = (kD^2 L)/100$$

where T_d is the tons of material produced per day

D is the kiln shell diameter in feet

L is the length of the kiln shell in feet

k is a constant depending on local conditions such as the kind of material being processed, the operating conditions, etc. Under normal conditions, k is usually 1.0 for dry fed kilns burning lime, cement, dead-burned dolomite, and wet fed kilns the feed of which contains less than 40 per cent of water.

In the above formula, it will be noticed that the production rate is proportional to the volume of the kiln. There has been a tendency to use a fixed ratio between the diameter and length of the kiln. By so doing, the relation between the kiln diameter, length, and its productive capacity will be definitely established. Furthermore, the fundamental formula can be given simply in terms of daily production and kiln diameter.

This is shown in the following way. Let us assume that the optimum length of the kiln is some number (x) times the diameter, so that:

$$L = xD$$

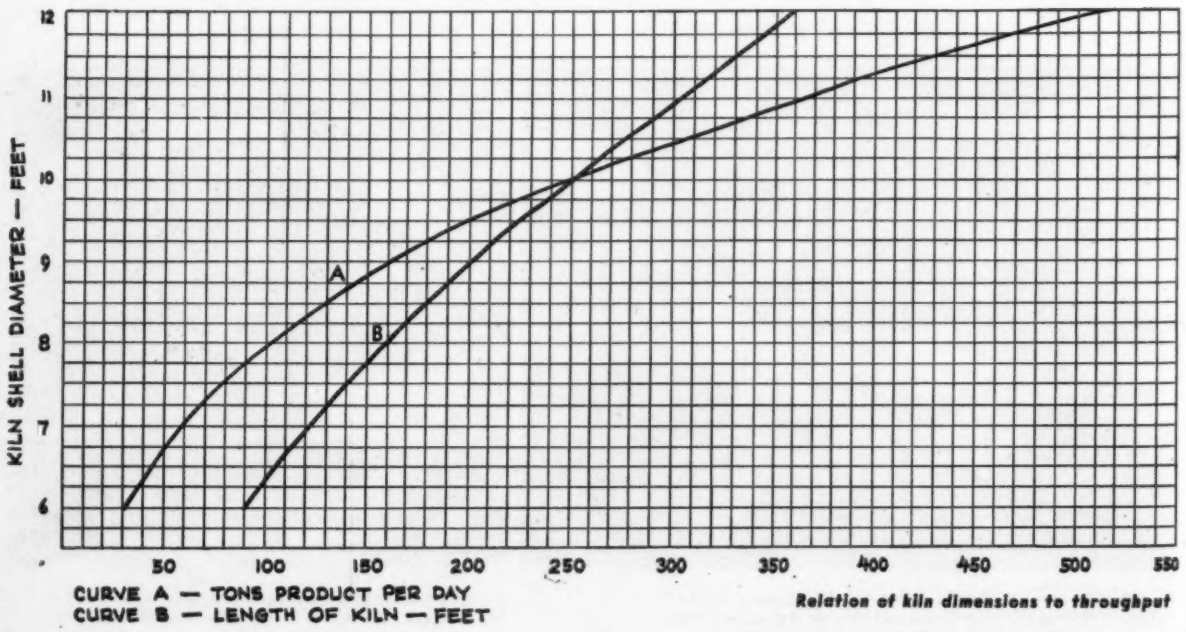
then the fundamental formula will be

$$T_d = (k \times D^3)/100$$

Practice has shown that x has a value somewhere between 15 and 30. In other words, if the kiln is somewhere between 15 and 30 times the diameter in length, it is assumed to be economically proportioned.

It is easily understood that the longer the kiln for a given diameter, the greater will be the opportunity for getting the heat from the hot gases of combustion into the load. On the other hand, the longer the kiln is, the greater will be the maintenance, the power, the loss of heat through the shell, and the original cost charges. Consequently, the most economical length of the kiln will be such that the cost of operating it will be a minimum for each ton of material produced.

Further study has indicated that the practice of assuming a fixed ratio between the length and diameter leads to some very uneconomical sizes of kilns. For all ordinary calcining operations, it appears that the length of the kiln should be proportioned to the square of the kiln diameter rather than to the simple diameter.



Relation of kiln dimensions to throughput

Ratio of Kiln Diameter to Length

A study of economical rotary kiln operation has shown that the ratio of kiln diameter to length should be:

$L = x D^2$ and x will have a value of about 2.5.

The fundamental formula now will have the form of

$$T_d = (k \times D^4)/100$$

Value of k

The value of k is dependent upon local conditions as mentioned above. Normally, it is about 1.0. There are cases, however, where it has been found as low as .75 and as high as 1.5. This wide variation will be found to exist because of (a) poor or good operating conditions or (b) improperly or properly proportioned kiln. When a low k value prevails, something is definitely wrong with the operating conditions. When a high k value is found, operating conditions are good. Normally, the value of k will decrease approximately 0.07 for each 5 per cent of water in excess of 40 per cent in the feed. Thus 45 per cent water in the feed will reduce the normal k value to about 0.93; 50 per cent water in the feed will have a k value of about 0.86; and 55 per cent water in the feed will bring the k value to about 0.79.

Diam. of Kiln (in ft.)	Length (in ft.)	Tons/day Production
6	90	32
7	122	59
8	160	102
9	202	163
10	250	250
11	302	365
12	360	518

Sizing the Kiln for the Job

With the above relations at hand, it is comparatively easy to determine the proper size kiln for any normal job such as recovering lime from the recausticizing process of the paper industry or burning lime from limestone.

The relation to be used is:

$T_d = (k \times D^4)/100 = 1.0\ D^4\ 2.5/100 = 0.025\ D^4$ and $L = 2.5\ D^2$

The accompanying tabulation shows how the diameters, lengths, and productions are related for normal kiln operations according to the above relationship assuming a k value of 1.

Wet End Water Removal*

Factors Involved in Removing Water During Sheet Formation by Means of Vacuum Pumps

CARLETON CLARK
Clark and Vicario Company**

▶▶▶ THE PROBLEM OF water removal on paper machines has reached entirely new proportions within the past decade. More and more water has been added to the machine furnish in order to maintain quality as a result of tremendously increased machine speeds.

For instance, the consistency at the head box on certain high-speed machines has been reduced to less than two-tenths of 1 per cent. As much as 30,000 gpm has been introduced on one fourdrinier at the slice. Since 99 per cent of the water must be removed before the sheet hits No. 1 dryer, and further that this must take place in three to four seconds or less between the head box and No. 1 dryer, the job of water removal is not always simple. The rate of drainage, or water removal, on a fourdrinier machine must be controlled to give the fibers the longest possible opportunity to distribute themselves properly.

Increased water removal would be no great problem if the fourdrinier wire could be extended indefinitely in length for a given machine speed. However, for reasons of economy, the length of the fourdrinier wire must be limited as far as possible.

Natural drainage plus the pumping action of the table rolls removes the major part of the free water before No. 1 suction box. At speeds of 1200 fpm and over, this has to be carefully controlled to prevent table rolls splashing or throwing water back through the wire, disturbing the loosely matted fibers, and upsetting formation. For this reason, some consideration is being given to the elimination of table rolls on the first few feet of the fourdrinier following the breast roll to help control the drainage without upsetting formation.

Suction Boxes

The function of the flat boxes has become more important since the quantity of water to be removed by these flat boxes has been increased tremendously. The sheet arrives at No. 1 box at 1 to 3 per cent consistency. On a 600-ton machine, 5000 to 6000 gpm must be removed by the flat boxes, and 90 per cent of this may come out on the first two or three boxes, depending, of course, on whether or not a secondary head box is used.

The time available for natural drainage between the breast roll and No. 1 flat box has been reduced because of increased machine speed, and also because the quantity of water to be removed has been increased tremendously, as previously explained.

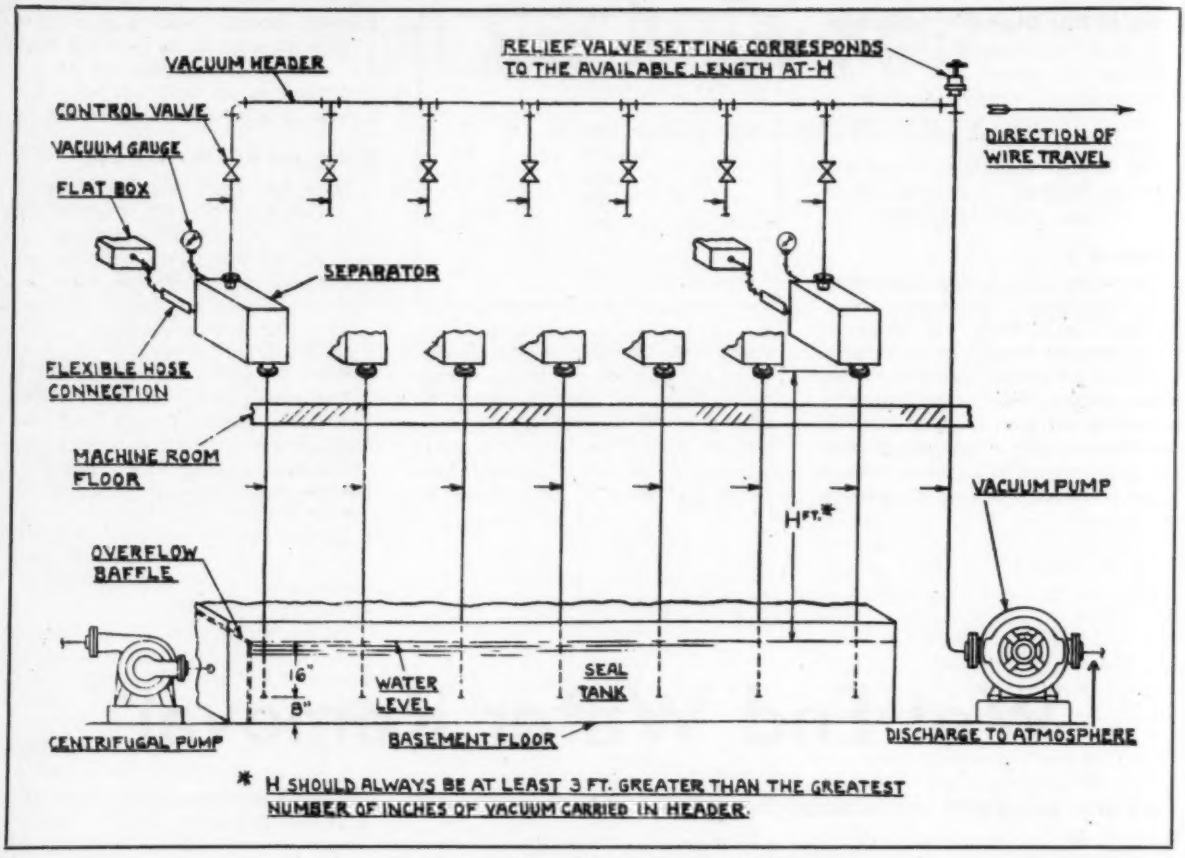
Prevent Flooding

Many mills have experienced difficulty with flooding of existing flat boxes which were designed for slower speeds causing uneven vacuum on the boxes, wet streaks in the paper, chatter of the wire at the boxes, and slippage of the wire at the couch. Deeper and wider suction boxes with much larger outlets are now being used. At times, double outlets are used on both the front and back sides of the first two or three boxes in order to get the water out quickly. This alternative is sometimes applied on old-style small boxes with fair results.

As mentioned before, the flooding of the first few boxes can cause pulsating flow and may cause the sheet to run wet on the back side. This seems just the reverse of what would be expected with the outlet on the back side of the machine. However, with the water building up in the box toward the back side and flowing in that direction trying to get out of a small outlet,

(*) Adapted from paper presented as part of the Black - Clawson - Shartle - Dilts Lecture Course Program, first series for 1948 at Shartle Brothers Machine Company, Middletown, Ohio.

(**) Representative of Nash Engineering Company, South Norwalk, Connecticut.



Vacuum and separator system for fourdrinier flat boxes

this occurs. Wider and deeper boxes with larger outlets are often advocated to eliminate this flooding.

Quite often, this recommendation is misconstrued to mean greater water removal at the first two or three boxes. However, this is not necessarily so. If the suction box is deep enough and the outlet is large enough to allow the water to flow out along the bottom of the box with room for air to pass over the top of the water, the flow will be more uniform. Water removal across the boxes will then be uniform and the vacuum may be controlled more easily without fluctuation. Usually a lower vacuum will suffice to do this work.

Some mills have added suction boxes in an attempt to overcome flooding difficulties on the first two or three boxes. Additional boxes have little effect on the results obtained in the first two or three boxes, and therefore are not necessarily the solution of the problem. However, it is quite often possible to replace three boxes of the old design with two new ones, obtaining better results than before.

It has been found in checking several machines that the vacuum on the front side of No. 1 box might be zero and the vacuum on the back side 10 in. At No. 2 box the difference may be 3 inches in front and 10 inches in back, and on No. 3 box the difference may be 7 inches in front and 10 inches in back. No. 4 box if comparatively dry would show about the same on both ends at the box. Progressing down the machine from the breast roll, there is less water to be handled and the loss through the box outlet is therefore decreased. Deep boxes with large outlets will therefore be most helpful on the first two or three boxes numbering from the breast roll.

The vacuum control valve on the boxes should be in the air lines only, so as not to obstruct the flow of water, if individual barometric legs are used on the suction boxes. The control valve in the box outlet throttling both air and water, tends to cause fluctuation.

Vacuum Control

It is sometimes necessary to use small spring loaded relief valves on the first one or two boxes. Where the main control valve is tightly closed between the separator and the vacuum pump, the water passing down the barometric leg may produce a higher vacuum than desired. These special relief valves can be set at the maximum vacuum required on these boxes, and will break the vacuum in the barometric leg to obtain the desired control.

Vacuum should be kept as low as possible to minimize wire wear on the boxes and to prevent wire slipping on the couch. If greater water removal is necessary, an attempt should be made to effect this at the couch roll either by raising the vacuum or possibly making a change in the construction of the couch roll itself.

Piping and Separators

There have been many "flat box systems" advocated. Regardless of the particular system employed, adequately sized piping and separators are required to obtain complete separation of air and water for accurate control and for most efficient operation. This applies to felt boxes on both cylinder and fourdrinier machines to a somewhat lesser degree. Many systems have been thrown out which would have worked very well if the separators and piping had been ample to minimize friction loss and permit complete separation of air and water.

A good method of checking for outlet restriction is to check the vacuum on the front side of the box as against

the usual vacuum indicated on the back side. Flat box vacuum pumps generally can be reduced in size if the piping and suction boxes are adequate. The greater the restriction in the piping the larger the vacuum pump must be to overcome this restriction.

It is recommended that large, special separators should be used at the outlet at the point where separation of air and water takes place. This reduces velocity of air and water at the point of separation, eliminating splashing, foaming, and carryover of the white water through the vacuum control valves and vacuum pump. It would be possible to use ordinary pipe tees for this purpose, except that pipe tees of sufficient size require more space than is available back of the machine. Therefore, ordinary steel boxes of adequate area for the purpose have been designed. Many new machines today are equipped with this type separator.

When making closed sheets such as bond or writing, it may be possible to connect the air header for the flat boxes to the couch vacuum pump as very little air is removed from these boxes and, therefore, little change will be made in the vacuum obtained at the couch as a result of this cross connection. It is not advisable, however, on free sheets, since the air removed from the flat boxes must be expanded again from the vacuum in the box to the vacuum at the couch, which means a larger pump for this purpose.

Control is also made more difficult because of such a cross connection. As a general rule, it is far preferable to install a separate pump for flat boxes. First cost and power consumption are small for this service.

Suction Couches

Many variations of the suction couch roll are in use today. These include the single box design, which is the original type; the dual box design, used most commonly in Canada on newspring machines; and the dual, or double couch design, with two couch rolls in series.

A great deal of experimental work on suction couch box widths is going on at the present time to determine the proper width box in the couch for a given grade of paper. Couch boxes today vary from 4 inches in width up to 24 inches. The box width on an individual couch roll should be determined by the grade of paper being made and the speed of the machine. Vacuum pump sizes for suction rolls are based on the total area of the boxes in the couches.

To determine whether or not the suction couch roll on a given machine is doing good work, it is necessary to take a moisture content test of the sheet leaving the couch. 18 to 22 per cent dry on lightweight papers running at 1500 ft is considered good. 20 to 22 per cent on heavy kraft board running up to 1300 ft is considered good.

What Size Vacuum Pump?

No way has been determined to establish a definite formula for selecting a vacuum pump for a suction roll. This selection is affected by the width of the machine, width of the box, freeness and moisture content of the sheet, speed of the machines, length of the wire, number of suction boxes on the wire ahead of the couch, temperature of the stock, and even the temperament of the superintendent running the machine.

Up to speeds of 1000 ft, it has only been necessary to maintain a sufficiently high vacuum to remove the pond formed at the nip to prevent crushing. At speeds of 1000 ft and over it is necessary to maintain a relatively high vacuum to purge the water from the holes in the press roll to prevent its being thrown back into the felt, rewetting the sheet. This problem on machines running above 1000 ft has increased pump sizes and altered recommendations for vacuum pumps considerably.

Felt conditioners of various types are being successfully used, namely: the slotted box type, the suction roll type, and the traveling shoe type. All of these have undergone certain changes and improvements to increase efficiency on high speed machines. These also affect the selection and operation of vacuum pumps. Air requirements are based on machine speeds as well as total surface of felt under vacuum.

If an individual mill has a check on the moisture content of the sheet leaving the couch as well as a check on the moisture content of the sheet entering the dryers, it can easily be determined whether it would be worthwhile to consider additional moisture removal equipment. If ample equipment is already available, it could be determined whether it is working to best advantage.

Check Moisture in Sheet

The following figures on moisture content of the sheet entering the dryers may be well worth noting. These were obtained as a result of many recent tests made in the field. On book and writing papers a check of the moisture content on 38 different machines indicated an average of 35.4 per cent dry, with 39 per cent being high. On fifty board machines, the average is 35.8 per cent. On writing papers it varied from 33 per cent to 40 per cent. On tissue and absorbent papers it varied from 27 per cent to 35 per cent dry. On kraft paper, the average was 30 per cent dry although we have seen it as high as 35 per cent. On glassine, 19.5 per cent to 23.5 per cent dry. On cylinder straw, the average is 40 per cent. On white patent board, 36 per cent.

The same water removal problems exist, to a lesser degree, on cylinder machines. However, the rate of formation so far on cylinder machines is much slower, since 500 fpm would be considered a high speed machine, as against three to four times that speed on a fourdrinier.

Cylinder Machines

Many and various types of suction rolls are used on cylinder machines, among which are the suction tail roll, which is in the tail position on the machine immediately following the last cylinder mould. The modern version of this is the suction drum roll. A variation of the suction drum roll is the suction drum press, which combines the drum roll and a press roll in one unit. The suction extractor roll performs a similar function.

Suction couch rolls operating on top of cylinder moulds have been used successfully on certain grades to help transfer the sheet from the cylinder mould to the felt. The suction press roll is the best known type of suction roll on cylinder machines. The speed of cylinder machines has not progressed to the point where we must consider the possibility of the water being thrown back into the felt due to centrifugal force. Therefore, the selection of pumps for this type machine is not greatly influenced by speed.

When the stock or furnish contains abrasive materials or when it is corrosive, separation of the air and water removed from suction rolls is advantageous both on cylinder and fourdrinier machines. Separation is generally desirable on machines making roofing felt, strawboard, and chestnut board. This separation is usually accomplished with a combination tank and special centrifugal removal pump, which is capable of handling white water under vacuum.

It is advantageous to separate the air and water from all felt conditioners, suction extractor rolls, suction drum rolls on cylinder machines and sometimes suction couch rolls on high-speed fourdrinier kraft board machines because of the large quantity of water removed by these rolls. It is possible to handle water with the air in the vacuum pump, but if the percentage of water is too great, a loss of vacuum and an increase in horsepower required will result.

How Automatic Controllers Work

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EDITOR'S NOTE: Here is the second part of a lecture course used by the author in teaching inexperienced employees the basic fundamentals of automatic control. Final article of the series will appear in a subsequent issue of THE PAPER INDUSTRY AND PAPER WORLD.

▸▸▸ THE FUNDAMENTAL purpose of automatic control is to maintain a balance between the input and output of a process.

For example, let us consider the tank of water shown in Figure 1. Water feeds into the tank through valve A and through valve B. It is desired to control the level at a fixed point. To provide an indicator of level let us install a float to ride on the surface of the water and connect it to a pointer to indicate the level on a water and connect it to a pointer to indicate the level on a scale.

If the input through valve A balances the output through valve B, the level will stay constant at the desired point on the indicator scale. If the output is increased; that is, if valve B is opened slightly, more water will flow out than is flowing in, and the level will drop. The pointer will then show that the level has dropped below the desired control point. In order to return to the desired control point it will be necessary to open valve A to balance the new outflow. Balancing input against output is a basic principle of automatic control.

At this point we may be asked how liquid level compares with temperature level or some other form of measurement. Perhaps the fellow to whom we are talking bluntly says, "I'm not interested in maintaining a tank level. I am interested in maintaining a constant temperature in a room or in a machine." Perhaps his problems are along other lines and he may say, "I am interested in maintaining a pressure level or constant pressure in a pipe line." He may mention flow control, conductivity or any number of other types of measurement and control.

Same Principle—Many Variables

To establish the similarity of liquid level to other measurements let us now turn to Figure 2. You will recognize this as a typical water heater diagram. Steam flows in through valve A through a heating coil, and out through a trap. Cold water flows into the bottom of the tank, is heated and flows out through valve B. The input to this equipment is the heat supplied by the steam and the output is the heat given to the water.

To indicate temperature level on this system we can install a bulb in the tank and fill the bulb with a liquid. Whenever the temperature changes, the pressure within this bulb will change because of the expansion of the liquid. We will now connect the bulb to a bourdon spring with a capillary tube in order to transmit the pressure generated in the bulb to the bourdon spring. As you know, with an increase in pressure within the bourdon spring, the end of this spring will move outward. To this spring we will attach a pointer similar to our liquid level system and thereby obtain an indication on a dial. We have thus produced a temperature indicator to measure the temperature within the tank.

If we admit the correct amount of steam through valve A to heat the water to a desired temperature, the process will come to a balance and the pointer will show that we have achieved the desired control point. Now as before, if we open valve B slightly we will allow more water to flow through the tank. Since the same amount of steam is being fed into the coil it is evident that the water will not reach the same temperature as originally noted. With the lower temperature, the thermal bulb will exert a lower pressure, the bourdon spring will partially collapse, and the pointer will drop on the scale. This is an example of *temperature level* control.

Returning to Figure 1 we note that both systems behaved in the same manner. An increase in output caused the indicator pointer to fall in both cases. It appears, therefore, that the operation of the temperature level controller follows the same pattern as the liquid level controller.

Now consider the pressure controller shown in Figure 3. Here it is desired to maintain a desired pressure within the pipe between valves A and B.

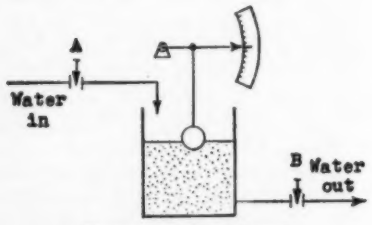


Figure 1—Liquid Level

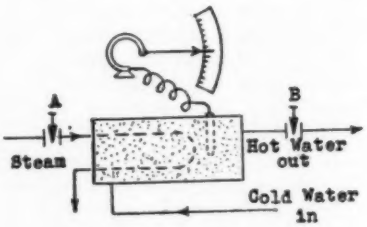


Figure 2—Water Heater

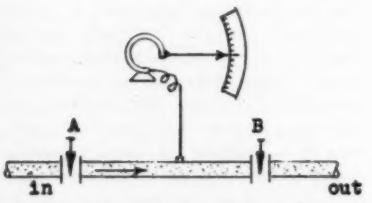


Figure 3—Pressure Regulation

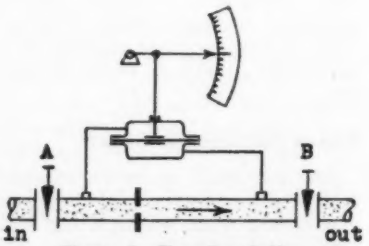


Figure 4—Flow Regulation

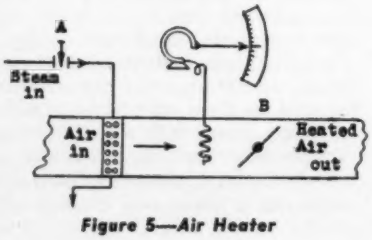


Figure 5—Air Heater

Basic Control Systems—Input through valve A must balance output through valve B to maintain constant value of variable.

Water enters the pipe through valve A and leaves through valve B, and by throttling valve A to balance the resistance created by valve B, a definite pressure can be established in the pipe line. To provide an indicator for this system, a connection is made into the side of the pipe and a short length of impulse tubing is run to a bourdon spring. To the bourdon spring is attached a pointer which will register the measured pressure on a dial.

If valve A is adjusted to the proper opening to balance a specific opening of valve B the pressure within the pipe line, or the *pressure level* of the system, will remain constant and the pointer will remain at the desired control point. If valve B is opened to permit an increase in outflow from the system, the resistance to flow at valve B will decrease and the pressure within the pipe line will fall. With the reduced pressure the bourdon spring will partially collapse and the pointer will drop on the scale. An increase in output has caused the pointer to drop in a manner similar to the liquid level and temperature systems.

Flow is measured by the differential pressure created by an orifice in a pipe line in Figure 4. The mechanism shown above the orifice consists of a diaphragm located between the high pressure and low pressure impulse chambers so that any change in differential pressure will cause the diaphragm to move and thus position a pointer on a scale.

As in the case of the pressure control system, if valve A is set to balance a specific outflow through valve B the system will be in balance and the pointer will indicate the flow rate or flow level on the dial. Again, if valve B is opened to increase the rate of outflow, the resistance at valve B will decrease, the downstream pressure at the orifice will decrease, hence the differential pressure across the orifice will increase. The increase in differential will cause the diaphragm to move downward and thus drop the pointer on the scale. As in the previous examples, an increase in outflow has caused the pointer to fall away from the original control point due to the unbalance of input to output.

To complete the picture, observe Figure 5 showing air heated by a steam coil. In this system a capillary-type bulb is used as the measuring element and the pressure developed therein is fed to a bourdon spring. If the proper amount of steam is admitted through valve A to balance a specific flow of air through damper B, a constant temperature will be maintained in the system. If damper B is opened to increase the outflow, it is obvious that the air temperature will drop due to insufficient steam input, and the pointer will drop on the scale.

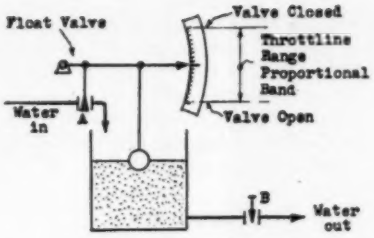


Figure 6—Liquid Level

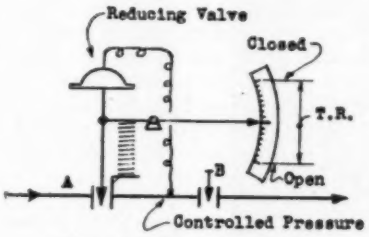


Figure 8—Pressure Regulator

Behavior of five basic control systems has disclosed that the fundamental of *balancing the input against the output* to maintain a desired level applies to each of the five systems.

Self-Acting Regulator

Up to this point manual control has been utilized to restore the balance in each system. Valve A was adjusted by hand to regulate the input to the process and it would soon be realized that this procedure is a tiresome task if the process is to be operated continuously under varying loads. In the case of the tank level control, we may reach a point of exasperation after attempting hand control for several days, and seek a means of automatic regulation. Observing the relationship of tank level to the flow through valve A the thought would occur to us that the float could be linked to the valve stem by a system of levers so that any change in water level would reposition the stem and regulate the input flow. This device could then be called a *self-acting regulator* as shown in Figure 6.

The liquid level system shows the previous tank level scheme but the float is connected to a lever that opens or closes the valve in accordance with the tank level. First, we will choose the point of maximum tank level and a linkage so that the valve will be fully closed at that position. The lowest permissible tank level is then selected and the lever system and valve are arranged to cause the valve to be fully open when in such position. The open and closed positions of the valve will then correspond to the extreme points on the dial scale pictured in the sketch.

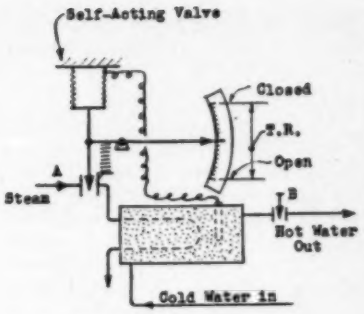


Figure 7—Water Heater

Self Acting Controllers—Any change of output through valve B causes a repositioning of valve A to balance the system

This span, or range of travel, can be labelled the throttling range or *proportional band* of the controller.

To provide true proportional action, we will design the port of the valve to throttle the flow proportional to the position of the stem which in turn is positioned by the lever acting as the indicator pointer. With the pointer at mid-scale, the valve then will deliver 50 per cent flow. For any other percentage of pointer or stem travel, the flow will be in direct proportion to the position of those parts. The device has now become a *proportional* type controller.

Proportional Action

Let us investigate the operation of the controller by visualizing the tank level system in operation. Assuming that the flow out through valve B is 50 per cent of the maximum capacity of the system, we can adjust the leverage and control valve to produce an equivalent flow of 50 per cent and the system will be in balance. The pointer will indicate 50 on the dial and will represent the desired control point for the system.

Now assume that the load or output flow is increased to 75 per cent. More water will flow out of the system than flows in, hence the level will begin to drop. As the level drops the float will cause the valve to open and increase the input flow. This rebalancing action will continue until the valve has been opened to supply the 75 per cent flow. The system will then reach a new balance and the level will remain constant. We will note, however, that the pointer is not at the original or desired control point, but has gradually dropped to the 75 mark on the dial. The action of this self-acting proportional valve is *typical*

of all types of proportional controllers; that is, to restore balance following a load change, the measured level must change in order to reposition the valve for the new flow.

To show that a temperature control system will behave in a similar manner let us now consider Figure 7 showing the previous water heater controlled by a self-acting device. The thermal bulb in this system is connected to the bellows of a self-acting valve. This bellows, because of the pressure exerted by the thermal bulb, will open or close the valve to throttle steam to the water heater. Note that the pointer is connected to the stem of the valve so that a temperature indication corresponding to the movement of the valve stem is obtained. If the flow out of valve B is 50 per cent of the total possible load and the temperature controller is adjusted to admit the correct amount of steam for this condition, the pointer will be at the midpoint of the scale.

The system will control satisfactorily with constant flow through valve B, but as before, if we open valve B to allow a greater flow of water through the heater, the temperature in the tank will drop. The thermal element will generate less pressure, the bellows will contract and the valve will open to admit more steam to the heating coil. The system will come to balance when the valve has opened sufficiently to balance the new load but we will find the pointer below the desired control point on the dial. This performance is identical to that of the liquid level control previously described.

As a further example of a proportional controller, consider Figure 8 showing a pressure regulator of the self-acting type. Note that the pressure within the line under control is fed back to a diaphragm top. This in turn positions the stem of the valve and thus regulates the flow through the valve. The pointer is connected to the valve stem and registers the water pressure on the dial.

We can, as before, balance this valve to the desired control point at the center of the scale and as long as the load through valve B is 50 per cent, the controller will maintain the desired pressure in the pipe line. If this load is increased to 75 per cent, the resulting drop in pressure in the pipe will cause the valve to open. When the valve has opened to deliver 75 per cent flow, the system will again come to balance but the pointer will be below the desired control point on the dial.

Reviewing the three systems just described it is evident that the same principles apply to all types of self-acting regulators. First, the throttling range is determined by the amount of movement required of the controlling valve to travel from the minimum to maximum position; second, a load change causes the pointer to deflect from the original setting. This action, known as *offset* from control point is required to rebalance the controlling valve following a load change.

Controller Operation

To demonstrate the operation of a self-acting controller, the unit shown in Figure 9 is helpful. To supply water to the panel, a sump tank and pump are located at the left side of the panel. This unit pumps water to a constant head point above the panel, thus providing a constant pressure to the input valve or float valve. The water flow is regulated by the position of the stem of the valve. On leaving the valve, the water passes up and over a pipe loop in order to maintain a constant back pressure on the valve. The water now passes down a supply tube and finally reaches the transparent tank. Level in this tank is the variable to be controlled. In order to readily see the changes in level, a ball float has been installed in the tank and by a system of linkages, the level changes are recorded on a circular chart.

As the water leaves the tank it will pass out through one or more pet cocks located in the discharge pipe. These pet cocks each have a flow value of 25 per cent of the total flow of the system; that is, with four valves open the flow will be 100 per cent, with two valves open the flow will be 50 per cent. These pet cocks provide the means of changing the load on the process. As the water leaves the pet cocks it flows back to the sump and is available for further recirculation.

The lever from the float to the recording mechanism is connected to the valve stem so that a decrease in level will cause the valve to open. The throttling range of this device is 100 per cent of the total chart travel; that is, the pen must traverse 100 per cent of the chart to move the valve from the closed to open position.

By opening two of the loading valves we can set the load on the process at 50 per cent. By adjusting the stem of the control valve, the input flow can be made to balance the output flow when the pen shows 50 or the midpoint of the chart, and the self-acting device will provide stable control under this load.

The chart bears a red band to indicate the required control band of plus or minus two degrees. Our aim then, is to control the tank level, to hold the pen within the red band.

As the load is increased the water level begins to drop and thereby causes the valve to open wider. When the valve is opened to the 75 per cent flow rate, the process is again in balance, but you will note that the recording pen has dropped to the 75 mark on the chart. The system is in stable control but not at the desired control point. A corresponding deviation of the pen would occur if the load were set at some other load such as 25 per cent.

As we reset the loading valves to return to 50 per cent the level in the tank will begin to rise. As the level returns to the original position, the control valve will be delivering 50 per cent of flow and the system will again be in balance. The pen has now returned to the red band.

The action of any proportional type control will be found to follow the same pattern as the level device shown in this demonstration.

Because of friction between the stem and stuffing box, the small amount of force developed by the float is insufficient to accurately position the valve. This condition will be found to exist in many types of self-acting devices with the exception of self-actuated pressure controllers.

For instance, if we should design a temperature controller to be operated by the action of a bourdon spring, we would find that the force developed by the spring to be in terms of "flea power." Such small forces could hardly be expected to position a large valve. We must utilize power from some external source to motivate the valve, and the source should permit the valve to be located at some distance from the controlling unit.

Electric contacts could be mounted above and below the float arm. As the level rose, the upper contact would be made and the current would cause a motor-driven valve to close. As the level fell, the lower contact would be made, and the motor would reverse, causing the valve to open. This type of control would produce *on-off* action and would be suitable for many installations, such as an extremely large tank wherein the valve could open and close yet cause only a slight change in liquid level.

Pneumatic Operation

A step further is to design a valve that can be regulated by compressed air. The flexible diaphragm offers a simple means of converting air pressure to mechanical motion, such as pushing the stem of a throttling valve, so our design will begin with a cast iron housing enclosing a rubber diaphragm. A pusher plate, placed under the diaphragm, is attached to the valve stem so the motion of the diaphragm will be transmitted to the stem. Air

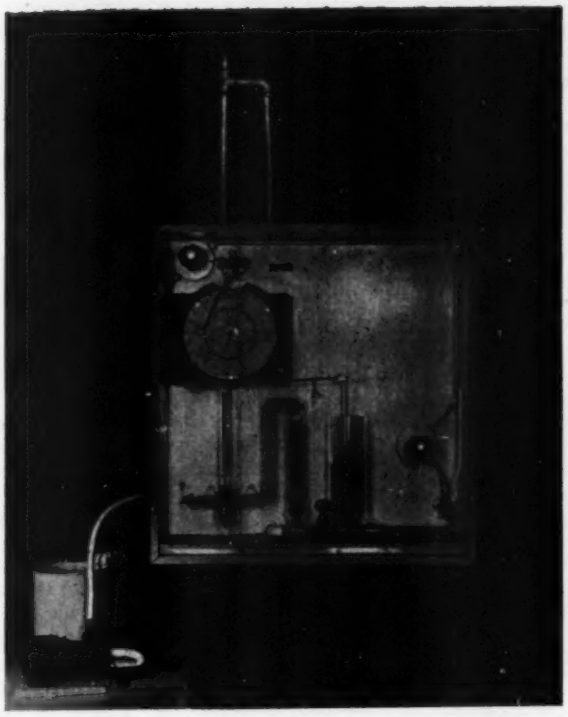


Figure 9—Demonstration panel showing self-acting unit; float operated valve controls liquid level

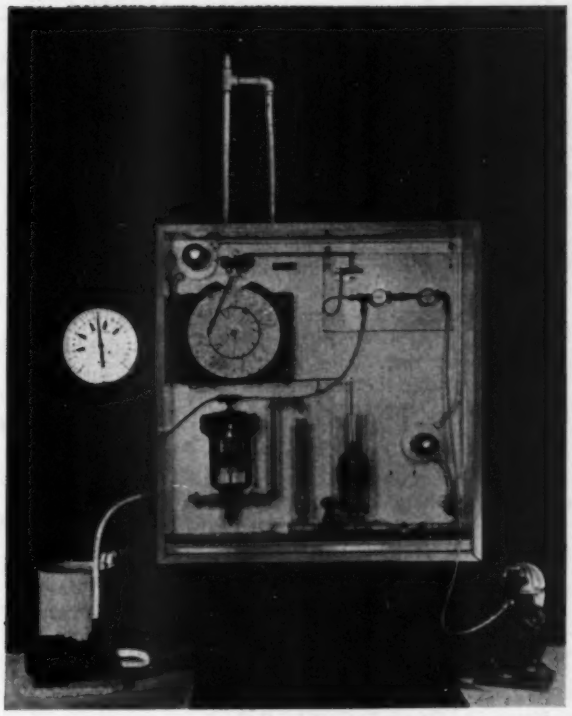


Figure 11—Air operated controller; liquid level float regulates air discharge from nozzle to position the valve

pressure applied to the top of the diaphragm will cause the stem to move downward and open the valve port. A spring will now be located below the pusher plate to oppose this action. Since the deflexion of a spring is directly proportional to the applied force, the downward motion of the valve stem will be directly proportional to the air pressure imposed upon the diaphragm. We will now select a spring having sufficient strength to hold the valve stem at the topmost or closed position when 3 psi pressure is applied to the top and as the diaphragm pressure is increased to 15 psi, will force the valve stem to travel downward to the full open position. The full stroke of the valve used in this demonstration is ½ inch.

The design can be modified to meet various requirements such as *air to open* or *air to close* and by increasing the area of the diaphragm, sufficient force can be obtained to operate extremely large valves or dampers. Connecting tubing can be run for some distance to permit remote operation of the valve.

Controller Design

Our next problem is to design a controller to modulate the air pressure to the valve in accordance with some measured variable, such as temperature or liquid level.

We know that blocking the flow from an open nozzle will cause an increase in back pressure within the nozzle. To apply this action we can make use of a small nozzle and a hinged baffle or flapper. Supply air will be fed to the nozzle through a short length of tubing containing an orifice or restriction. As the flapper is advanced toward the nozzle, the back pressure at the nozzle will increase because the orifice is supplying more air than can escape from the nozzle. If the flapper is withdrawn from the nozzle, more air escapes from the nozzle than is supplied by the orifice and the nozzle pressure will decrease. A range of back pressure of 3 psi to 15 psi can thus be obtained by moving the micrometer stem.

Now connect the baffle to the measuring element of the instrument which may be a bourdon spring, bellows or diaphragm. The force required to position the baffle against the nozzle is so small that a bourdon spring is sufficient to actuate the baffle.

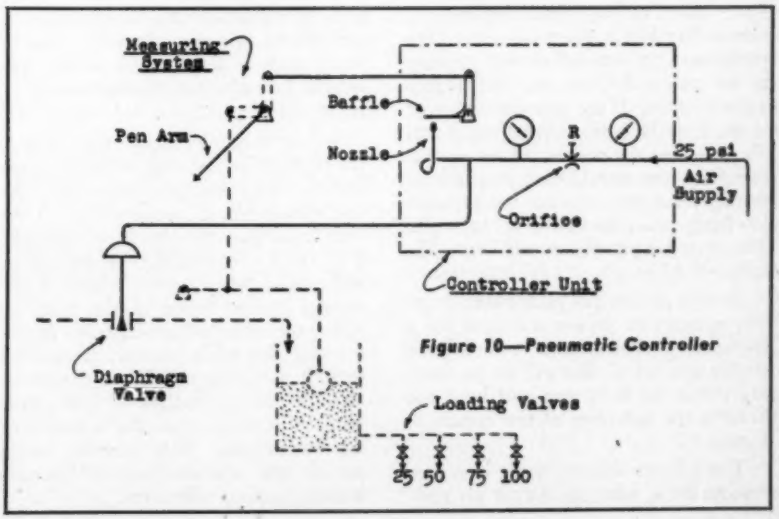


Figure 10—Pneumatic Controller

Figure 10 shows an air operated control device with the float arm motion mechanically transmitted to the control unit. Considering the float mechanism and recording pen arm as the "measuring system" of the instrument, once the variable has been measured by a recording mechanism, the motion of the pen arm can be used to operate the controller mechanism. Any instrument, whether it be for measuring temperature, humidity, conductivity, *p*H, etc., will be found to contain two major parts; the measuring system and the controlling mechanism. Figure 10 purposely shows these units as separate assemblies within the instrument.

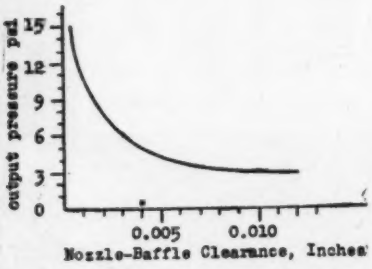


Figure 12—On-off Controller—output versus nozzle-baffle clearance

Supply air at 25 psi is introduced at the right hand side of the unit and is passed through an orifice marked R, thence to the nozzle on the left hand side of the panel. A branch from the nozzle line is connected to the diaphragm valve shown in the lower left hand corner. A baffle is located above the nozzle and is connected by linkages to the pen arm of the measuring system. Motion of the pen arm will cause the baffle to be raised or lowered and thus restrict, in varying amount the flow from the nozzle.

If the pen arm is moved to the right, the baffle will be lowered causing the flow from the nozzle to be restricted. Since more air will feed through the orifice than bleeds from the nozzle, the pressure in the nozzle line will increase to 15 psi and cause the diaphragm valve to open. If the pen arm is moved to the left, the baffle will be raised and thus uncover the nozzle. More air will bleed out the nozzle than is admitted through the orifice, hence the pressure in the nozzle line will drop to 3 psi. The diaphragm valve will then be fully closed.

At first glance this rather simple device appears to answer our need for a modulating controller to position the diaphragm valve. We will set the loading valves for a 50 per cent load and observe the behavior of the system in Figure 11.

The process appears to be in a continuous cycle with the output air pressure from the controller cycling from one extreme to the other and the recording pen drawing a line first above and then below the red band. It is evident that the process on the panel requires a control unit with greater proportioning action than is obtainable with the simple nozzle-baffle assembly.

To produce a controller unit having a wide throttling action we must develop an entirely new type of mechanism. As a starting point, let us examine in detail the operation of the nozzle-baffle system to determine the factors responsible for the on-off action.

Returning to the flapper-nozzle assembly, we will find that for every setting of the clearance between the nozzle and stem there will be a corresponding back pressure developed at the nozzle. For instance, if the clearance is 0.0005 inch, the back pressure will be 15 psi. Increasing the clearance to 0.001 inch will cause the back pressure to drop to 12 psi. By making a series of settings and noting the corresponding back pressures, a table can be prepared as shown.

Inspection of this table reveals the reason for the lack of proportional action in the on-off unit. It will be noted that for very small changes in nozzle-baffle clearance, such as changing the clearance from 0.0005 inch to 0.0015 inch, will cause the back pressure to drop from 15 psi to 9 psi and in turn cause the controlling valve to move from the full open position to the 50 per cent open position. The valve has thus been moved through half of its stroke by a very slight motion of the baffle, in this case, one-thousandth of an inch.

Mechanical Linkages

It can be readily understood that the linkages between the recording pen and the baffle must be entirely free of backlash or lost motion if the baffle is to be accurately positioned to match the position of the pen arm. In attempting to build such a linkage we would undoubtedly introduce friction because of tightly fitted pivots.

As we sought to reduce the friction, the problem of lost motion would again appear. After building and rebuilding the linkage system, we would reach the conclusion that the scheme was impractical for a commercial type controller, and would turn to some means of obtaining greater travel of the baffle to lessen the effects of lost motion. By increasing the baffle movement to 0.25 inch, it would be possible to permit an accumulated lost motion of 0.001 inch with little effect upon the accuracy of the instrument. This scheme would permit the manufacture of linkages within practical tolerances.

Another fault in the on-off design is evident in the table. In the upper portion of the table it will be noted that a change in nozzle-baffle clearance of 0.0005 inch causes an output change of 3 psi while in the lower portion of the table a change of 0.0085 inch is required to produce an equal change in output. This represents a 17 to 1 ratio in the rate of response. In other words, if output pressures were plotted against nozzle-baffle clearance, the resulting plot would be a nonlinear curve as in Figure 12. It is evident that such nonlinearity cannot be allowed if the controller is to be truly proportional in its response.

Further experimentation with the baffle mechanism would reveal that whenever the back pressure at the nozzle reached the upper limit, the jet effect from the nozzle would lift the baffle slightly causing an erroneous response in the action of the controller. To overcome such a condition it would appear logical to limit the back pressure to a relatively low pressure such as 4 or 5 psi.

As a final step in our analysis, we would investigate the capacity of the on-off device to furnish air to a large diaphragm valve. It would be found that the orifice employed to restrict the flow of air to the nozzle also limits the quantity of air delivered to the valve. The rate of output flow to the valve be-

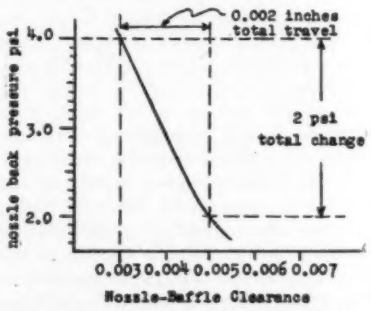


Figure 13—Back pressure plotted against nozzle-baffle clearance

ing slow, the response of the controlling valve will be sluggish. Since many installations require rapid valve action, it would be necessary to use some form of booster air valve to achieve the desired response. The design of a truly proportional controller should, therefore, include the following features:

1) The baffle should have a total movement of at least 0.25 inch to compensate for lost motion in the linkages.

2) The output pressure should change proportionally with the movement of the baffle since its position corresponds directly with the position of the pen on the chart.

3) The nozzle back pressure should

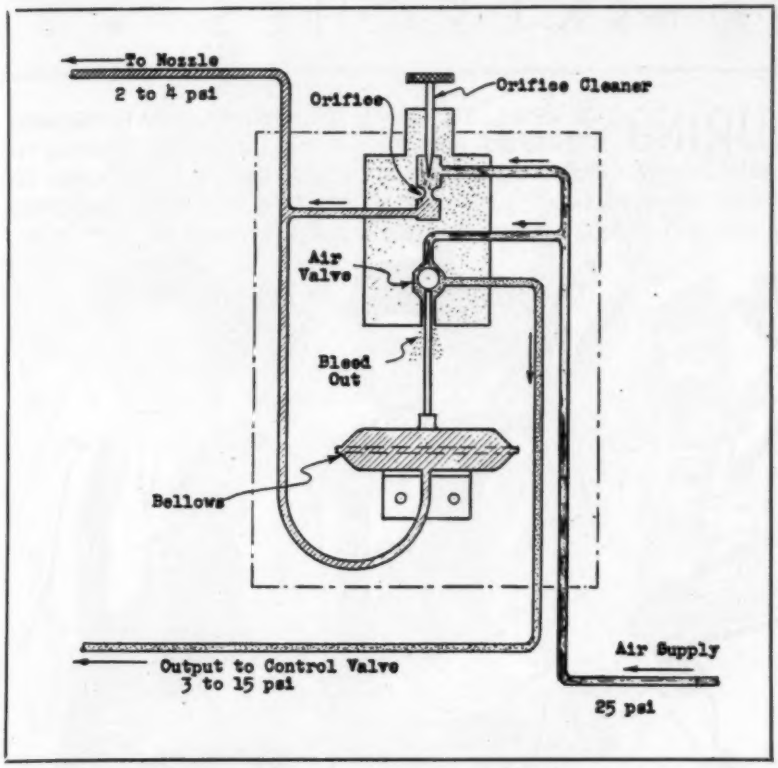


Figure 14—Air relay changes low pressure nozzle impulse to high pressure

be low (a maximum of 4 or 5 psi) to improve the linearity of response and to minimize deflection of the baffle.

4) The controller should have ample output capacity to rapidly inflate large diaphragm valves.

As a starting point in the design of an improved controller, let us investigate the action of a small diameter nozzle when operated under low back pressures. Choosing a nozzle diameter in the range of from 0.020 to 0.030 inch and a suitable restricting orifice of approximately 0.011 inch, we can, by experiment, plot back pressure versus nozzle-baffle clearance as in Figure 13.

It is evident that the response curve is far more linear than that obtained with the previous design wherein the full range of 3 to 15 psi was impressed upon the nozzle. Greater linearity is due to the use of an extremely small pressure change; that is, the smaller the increment of change, the nearer the response will approach straight line performance. It appears, however, that we are now dealing with extremely small changes in the nozzle-baffle clearance since the total change represented on the chart is only 0.002 inch. Naturally, such minute movement cannot be tolerated if the action of the controller depends solely on the clearance change, but as the design continues, we will discover that such small deviations can be used advantageously.

To make use of the improved linearity of the low pressure nozzle, yet provide the desired air pressure range to the control valve, we conclude that an amplifier or air relay is required to transform the nozzle impulse of 2 to 4 psi into an output range of 3 to 15 psi. The basic design of a typical air relay is shown in Figure 14.

Supply air is admitted to the relay on the right hand side as indicated by the red air tube. The line is split to feed two branches, first an upper branch to the orifice, and second a lower branch to the air valve. The orifice serves to restrict the flow of air to the nozzle as in the previous designs, but in this case, the air line leaving the restricting block, indicated by the yellow air tube, branches out to feed both the nozzle and a small bellows located below the air valve.

A pusher pin is attached to the top of the bellows so that any change in nozzle back pressure will cause the pin to rise or fall in accordance with the bellows pressure. The motion of the pin positions a small ball between two seats, the upper seat being the supply port, and the lower seat acting as an exhaust port. As the ball assumes a position between the two seats, a given amount of air will flow in the supply port and a corresponding amount will flow from the exhaust port.

The resulting pressure created in the valve chamber will vary with the position of the ball, hence this pressure can be utilized as the output from the relay. An air tube, colored blue, is shown connecting the air valve chamber with

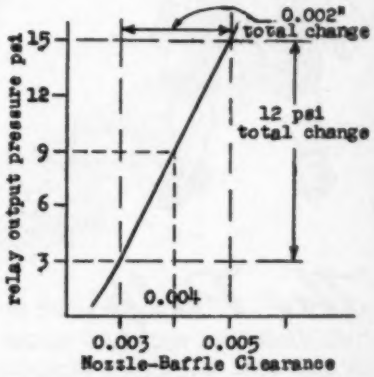


Figure 15—Low pressure nozzle with air relay produces a nearly linear response

the final control valve and this line can be labeled as the "output" from the air relay. The capacity of the supply and exhaust ports can be made sufficiently large to meet the demand for rapidly filling a large diaphragm chamber.

It is apparent from the sketch that the relay offers a relatively simple device for converting the small impulse received from the nozzle to an output pressure of the desired magnitude. A plot combining the characteristics of the low pressure nozzle and relay is shown in Figure 15.

The improved linearity of response as obtained with the low pressure nozzle plus the relay will assist greatly in the final performance of the proportional controller we are about to design.

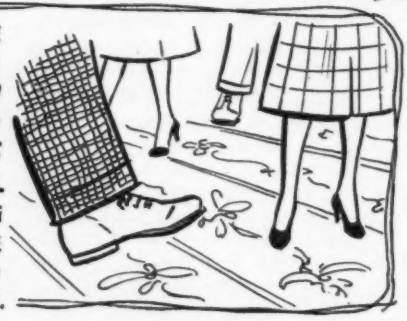
PAPER SKETCHES

DURING THE REVOLUTIONARY WAR, PENNSYLVANIA PAPERMAKERS INTERESTED IN JOINING VOLUNTEERS PREPARING TO MARCH ON NEW JERSEY WERE ACTUALLY PREVENTED FROM DOING SO BY THE PENNSYLVANIA COUNCIL OF SAFETY. DUE TO THE SHORTAGE OF SKILLED PAPERMAKERS, CONGRESS FORBADE THEM TO GO TO WAR.

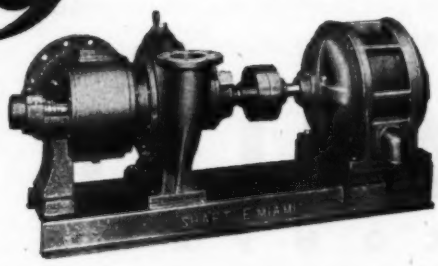
The Pulp MADE BY THE MANAYUNK WOOD PULP WORKS IN 1866 FOR AMERICA'S PIONEER PAPER PULP WAS THREE-QUARTERS WOOD AND ONE-QUARTER STRAW.

PROBABLY THE WORLD'S FIRST PAPER-MILL STRIKE WAS THE ONE STAGED ABOUT 1390 BY THE ITALIAN EMPLOYEES AT NUREMBERG, GERMANY, WHEN ULMAN STROMER, THE MILL OPERATOR, THREATENED TO ADD A THIRD WHEEL TO HIS EQUIPMENT TO SET ADDITIONAL STAMPERS IN MOTION.

IN A RECENT TEST, THE FLOOR OF A PUBLIC BUILDING WAS ACTUALLY WALLPAPERED! LAID OVER A FLOOR PREVIOUSLY SEALED WITH SHELLAC, THIS WALLPAPER WAS GIVEN A PROTECTIVE COATING. HUNDREDS OF FEET, POUNDING CONSTANTLY OVER THE SURFACE FOR FIVE MONTHS, FAILED TO WEAR OUT THE WALLPAPER.



(Top) AGI-FLO PUMP for external agitation.
(Left) PROPELLER AGITATOR from drive end.
(Below) "HMS" PUMP for high-density pumping.



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This view of the speakers table of the Canadian Technical Section luncheon showed such prominent men as (L to R): Dr. W. Boyd Campbell, director of technical research, Pulp and Paper Research Institute of Canada; E. G. Kirby, councillor, Technical Section (Price and Pierce Ltd.); A. E. Bachmann, vice president TAPPI of U.S. (Missisquoi Corp.); G. A. Franklin, councillor, Technical Section (E. B. Eddy Co.); Dr. Otto Maass, general director, Pulp & Paper Research Institute of Canada; Dr. B. Steenberg, director of research, Swedish Forest Products Research Laboratory, Stockholm, Sweden; Dr. J. Edwards, councillor, Technical Section (Price Brothers & Co., Ltd.)

Thirty-Sixth Annual Meeting of Canadian Technical Section

▸▸▸ CANADA'S GREATEST industry marked another year of progress last month at the thirty-sixth annual meeting of the Canadian Pulp and Paper Association. Some 1200 representatives of the pulp and paper and allied industries gathered at the Mount Royal Hotel in Montreal for three days, beginning January 26, to participate in the technical and business sessions of the Association.

Special Awards Presented at the CPPA Luncheon

While the program of the three-day convention was predominately technical, the Canadian Pulp and Paper Association also held its annual council meeting. Chairmen of the different sections reported briefly on the activities of their groups during 1948.

The special Association award was presented to L. J. Belnap, retiring chairman of the Association's executive board and chairman of the board, Consolidated Paper Corporation, Limited, Montreal, in appreciation of his services to the Association during the past year. S. L. de Carteret, vice chairman of the executive board and president of Canadian International Paper Company, Montreal, presented the medal to Mr. Belnap.

The second special Association award was presented by Mr. Belnap to C. R. Whitehead of Montreal, in recognition of 26 years outstanding service in the interest of the Association's affairs.

R. M. Fowler, president of the Canadian Pulp and Paper Association reported on the status of the industry. His report in part follows:

The past twelve months was a year of new records of production and benefit to the companies, their employees, their customers, and to Canada. All my estimates are made in relation to 1947, which was itself a record year. The total estimated production of the Canadian industry increased by 260,000 tons and the gross value of pulp and paper production increased by nearly $100,000,000. There was thus not only an increase in value through price changes, but an absolute gain in productivity through increases in capacity and efficiency. I shall have a word to say later as to the expansion of pulp and paper exports, in value and volume, and the great contribution this has made to the improvement of Canada's exchange position.

There were 51,000 permanent jobs provided by the industry in 1948, apart from woods workers. Salaries rose to a total of approximately $146,000,000, an increase of nearly $17,000,000 over 1947. In addition, payments to woods workers in 1948 totaled nearly $132,000,000, an increase of $8,000,000 over 1947. Canadian governments will receive probably $12,000,000 to $15,000,000 additional from 1948 operations, bringing the industry's total tax bill close to $100,000,000 for the year.

The contribution of the pulp and paper industry to other industries and to the whole Canadian economy likewise has increased materially, although detailed figures for 1948 are not available. However, some idea of the way the operations of the pulp and paper mills provide jobs for Canadians in other industries can be gathered from the figures for 1947. In that year, transportation payments totaled nearly $120,000,000; chemicals cost over $52,000,000; electric power nearly $24,000,000; food and fodder approximately $25,000,000. All these figures can be increased safely by 12 or 15 per cent for the year 1948 by reason of increased volume and increased prices paid. Thus, in the year just past, the pulp and paper industry maintained its traditional place in the Canadian economy: first in production, employment, exports, and investment, and a major contributor to other great Canadian industries.

New capacity figures for the Canadian newsprint industry have just come to hand. They show a rated capacity for 1949 of 4,667,000 tons, an increase of 189,000 tons over the figure of a year ago. Despite drought conditions affecting many mills, both at the beginning and end of 1948, the newsprint industry produced over 150,000 tons more than in 1947, and 457,000 tons more than in 1946. The increase in capacity to produce newsprint has resulted from many mechanical and technical improvements at all mills. Without the building of new mills at today's prohibitively high construction costs, the cumulative effect of these improvements has added 388,000 tons to the productive ability of the newsprint industry in the past three years. This is equivalent to adding four new two-machine mills, and is almost equal to

R. M. Fowler (left) was again elected president of the Canadian Pulp and Paper Association. Shown with him are: L. J. Belnap (center), retiring chairman of the executive board of CPPA; and H. S. Foley (right), president Powell River Co., Ltd., newly-elected chairman of the Canadian Pulp and Paper Association.

half the entire newsprint capacity of the United States. This spectacular increase in productive capacity demonstrates the ability of Canadian manufacturers to respond to rising demands of their customers, particularly those in Canada and the United States.

Unfortunately, monetary difficulties in 1948 materially curtailed the ability of overseas customers to buy Canadian newsprint. This trend is likely to continue in 1949. As a result, publishers in Canada and the United States received substantially more newsprint and, while many demands for additional tonnage still exist, it is probable that newsprint supply on this continent is closer to satisfying the demand than it has been at any time in the past six or seven years. The prospect for 1949 is a continued over-all shortage of newsprint, but a fairly close balance between supply and demand and, certainly, few cases of serious shortage and distress.

Other branches of the industry have had a similar development in the past year. The increasing demand for kraft pulp has been reflected in the construction of three new sulphate pulp mills in Canada having a total projected capacity of some 160,000 tons annually. This production will be additional to existing capacity of some 800,000 tons a year, and will come into operation progressively in the next two years.

Pulp production, both for export and for domestic use, rose during 1948. The same statement can be made for almost every grade of paper production including wrapping papers, paperboard, book and writing papers, specialty papers, building boards and other products. With these improvements, which have been paralleled in the United States, it is not surprising that the gap between supply and demand for paper products on this continent has narrowed and, in some cases, closed. It is true that for most commodities, other than newsprint, the available supply is in reasonable balance with the demand. But the level of demand and consumption stands today at a very high point and it is absurd to talk of the present situation as being a "slackening" or "softening" of demand. I suggest also it is absurd to regard the attainment of the balance between supply and demand as something in the nature of a calamity. No industry can expect to operate permanently at, or above, its mechanical capacity. No industry can be fully efficient under such conditions. Where the whole emphasis is on production to meet unattainable totals of orders available, costs are likely to receive scant attention, quality may suffer, and the high arts of salesmanship and service tend to become rusty from disuse.

I think we should welcome the attainment of balance between supply and demand at the high levels existing today as an opportunity that has been lacking in the past few years to give greater attention to matters of quality, salesmanship, and service. I think we should cast our minds back to the days when the various segments of the industry were running at 60 or 70 per cent of a much smaller capacity in order to recognize that operation at 100 per cent, at 95 per cent, or even at 90 per cent of present capacities is a state of high good fortune and not, as some people seem to believe, the onset of utter ruin.

Ambridge is Speaker at Technical Section Luncheon

At the annual business luncheon of the Technical Section, presided over by F. J. Giffen, retiring chairman, several awards were presented.

The I. H. Weldon Memorial Medal was presented by its donor, A. L. Dawe, vice president, Consolidated Paper Corporation, Limited, Montreal, to E. T. Buchanan, assistant chief engineer, Consolidated Paper Corporation, Limited, Grand'Mere, Quebec, for his paper entitled *Suction Rolls and Vacuum Requirements* which was considered the best paper read at the Section's annual meeting last year.

The Technical Section Service Award, given to the committee chairman who has rendered the most valuable service to the section during the year was presented to J. B. Beck, superintendent, Hull specialty mills, The E. B. Eddy Company, Hull, Quebec, by R. L. Weldon, president, Bathurst Power and Paper Company, Limited, Montreal.

Shields were awarded to winners of the Safest Mill in Canada Contest. Winner of class A, for paper mills with over 50,000 man-hours per month, was Howard Smith Paper Mills Limited, at Beauharnois, Quebec, which had no accidents for 1,127,179 payroll hours in 1948. Kimberly-Clark Corporation of Canada's mill at Spruce Falls, Ontario, which had no accidents for 95,021 payroll hours was the winner in class B, for mills with under 50,000 man-hours per month.

Speaker at the luncheon was D. W. Ambridge, president of the Abitibi Power and Paper Company, Limited. He spoke on the need for more research by the Canadian pulp and paper industry. He pointed out that a great deal of research will be required to develop the potentialities of this industry.

Technical Section Officers for 1949

Chairman of the Technical Section for 1949 is John Buss, assistant general manager in charge of production, Provincial Paper Limited, Toronto, Ontario.

John Buss, of Provincial Paper Limited, who was elected new chairman of Technical Section of Canadian Paper and Pulp Association.

Two new councillors were elected, namely, John Hanna, mill manager, Bathurst Power and Paper Company, Bathurst, New Brunswick; and Walter W. Holland, general superintendent, Quebec North Shore Paper Company, Baie Comeau, Quebec.

Continuing Councillors are: E. G. Kirby, Price and Pierce Limited, Montreal, Quebec; G. A. Franklin, E. B. Eddy Company, Hull, Quebec; Dr. J. Edwards, Price Brothers and Company, Kenogami, Quebec; and W. C. R. Jones, Howard Smith Paper Mills, Limited, Beauharnois, Quebec.

Douglas Jones Reports Activities of Technical Section

Progress of the Technical Section was recorded in the report of Douglas Jones, secretary-engineer of the Technical Section.

We commenced 1948 with 927 members and admitted 159 new members during the year. We lost 39 members due to resignations, changes to other industries, etc. so that the net gain in membership was therefore 120. Our total active membership as of January 1, 1949 was 1047. Total affiliate membership is now 65.

During 1948, two new classes of membership were created. One, to be known as

F. J. Giffen, of Canadian International Paper Co., outgoing chairman of the Canadian Technical Section.

Retired membership, provides free membership for life for those members who, on retirement from active duty in the industry have been members in good standing for twenty-five years. The other new class membership, to be called Corporate membership, allows pulp and paper producing firms in countries other than Canada, to join the Technical Section. Canadian pulp and paper firms, as members of the Canadian Pulp and Paper Association, are already supporting the Technical Section, as the Association annually underwrites our budget.

The 1948 summer meeting was held in Vancouver, B. C., on September 8, 9, and 10. At this meeting, the Pacific Coast Branch of the Technical Section and the Western Branch of the Association, acted as our hosts. This was the first time in the 35 years of the Technical Section that our summer meeting has been held in British Columbia.

The St. Maurice Valley Branch of the Technical Section was formed in 1948. Serving in the world's largest pulp and papermaking area, it includes members from mills at Three Rivers, Shawinigan Falls, Grand'Mere, and La Tuque. This brings the number of branches to seven and with 269 members in the new branch, the total branch membership is now 1591.

The Alkaline Pulping Committee held a number of meetings during the year, one of them being a two-day "little summer" meeting at La Tuque, Quebec, where Brown Corporation acted as excellent host to the delegates from seven mills. Dr. J. H. Ross, consultant to the Research Institute, read a paper on the action of sulphur in alkaline pulping.

Seated together at the Canadian Technical Section's annual luncheon were R. G. Macdonald (left), secretary-treasurer of the Technical Association of the Pulp and Paper Industry; and Douglas Jones, secretary-engineer of the Technical Section, Canadian Pulp and Paper Association.

Two new projects were undertaken, one dealing with wood deterioration and the other with alkali room practice. On an older project to revise our standards, the committee was able to obtain the unanimous support of the Canadian industry for the new standard terms which will appear in the new text books.

The Board Committee has operated during the year with the subcommittee on printability. The main committee has completed work on the drying questionnaire which will be dealt with as a subject of discussion at the 1949 annual meeting.

The sub-committee has been actively working on four projects, namely the folding tester and creaser, the surface oil absorbency test, the determination of printing qualities of paperboard, and calender stack coating applications.

The Engineering Committee has continued throughout this year, meeting approximately once each month. The activities have centered around the preparation of a comprehensive questionnaire on maintenance and a study of various systems in use for the identification of mill piping. The committee has had prepared some panels showing the system it recommends.

The Engineering Data Sheet Committee has been very active, meeting weekly during some periods of the year. The task of completely revising and reclassifying all of the existing data sheets has progressed very favorably and during 1949 most of this material will be reprinted in loose-leaf form.

The Fine Papers Committee has been particularly energetic, holding many meetings, including a two-day meeting in Ottawa, where The E. B. Eddy Company acted as host. The mill scale investigations commenced in 1948, have included comparisons of pressure drop centrifugal pulp cleaning apparatus.

A full-scale comparative investigation of stock consistency regulators, undertaken by the committee, is under way at the Hull mill of the E. B. Eddy Company.

Other projects undertaken during 1948 and their present status are as follows:

(a) *Finishing Room Costs on a man hours per ton basis.* This work was co-ordinated by a subcommittee and a report based on a questionnaire was discussed at the Ottawa meeting. After some further compilation of data, copies of this report will be submitted to contributing mills.

(b) *Chemicals used in the Industry.* A report of the usefulness or otherwise, of various chemicals, etc., has been compiled by a subcommittee and will be distributed to contributing mills.

(c) *Materials Handling.* This subject has been discussed at a number of committee meetings and two papers have been arranged for the 1949 annual meeting.

(d) *Felts.* Considerable time was spent during the year with some of the felt manufacturers in an effort to program a joint discussion at the Annual Meeting. Due to conditions beyond the control of the committee, this could not be arranged.

(e) *Sizing Tester.* The committee has followed with interest Freeman Elliott's work in the development of a new sizing tester.

(f) *Mill Problems.* This general subject is discussed at all committee meetings. A group discussion has been programmed for the 1949 Annual Meeting under the general headings of stock preparation, paper machines, and maintenance.

The Heat and Power Committee has, at its meetings, continued to discuss and collect data on bark disposal, heating and ventilating, and heat pumps. Some study has also been made of the drying system, known as velocity steam drying.

E. W. Tinker, executive secretary of the American Paper and Pulp Association, who spoke at luncheon of Canadian Paper and Pulp Association.

The Mechanical Pulping Committee deserves great credit for its major contribution last year in its co-operation with the Mechanical Pulping Committee of TAPPI in planning and programming the Joint Mechanical Pulping Conference, held in Poland Spring, Maine, in September. This committee took a very active part in the conference and Canadian members generally presented a fair share of the papers read at this meeting. The meeting was pronounced a marked success by all those who attended.

The committee has closely followed the mechanical pulping research program at the Research Institute and in addition has conducted a study of the effect of fines in news-

print, and a study of maintenance and repair costs.

The Newsprint Committee has paid particular attention to operating problems and will sponsor a group discussion on modernization and speed-up of equipment in newsprint mills at the 1949 Annual Meeting. Other papers on various subjects will be sponsored.

The work of the committee in preparing a monograph of outstanding papers dealing with newsprint operation is progressing favorably. The sub-committee on Slime Control has held numerous meetings during the year, and is actively engaged in analyzing the answers to its questionnaire. It is hoped that eventually a monograph on slime control will be published.

The Process Instrumentation Committee has accomplished a great deal in its second year. The course of theory and application lectures during May at McGill University arranged by the committee were well planned, and the students (engineers from the mills of the industry) gained very valuable information. Future plans of this committee include a complete survey of the instrumentation in our industry, the preparation of a manual on instrumentation, and plans for on-the-job training of instrument mechanics.

The Physical and Chemical Standards Committee has continued its intensive study of existing and new standards. Five new standards have been approved as recommended standard methods and a number of other new standards are in preparation. Thirty-two previously issued standards have been checked and minor revisions made prior to reprinting.

The Sulphite Committee has devoted considerable time to the preparation of a manual of sulphite mill operating procedures. This manual is nearly completed and should be published in 1949. One of the committee members has prepared a review and index of all work undertaken by previous sulphite committees.

The Waste Committee has continued to act during the past year as a fact-finding group, compiling data of special interest to the industry on various phases of waste. Some studies have been undertaken on the evaporation and burning of waste sulphite liquor. Some of the mills are proceeding with pilot plant installations to investigate certain phases of this problem, and the committee is maintaining a close contact with this work.

The Wood Chemistry Committee has followed closely the progress of researches under way in the Department of Industrial and Cellulose Chemistry at the Institute. Dr. C. B. Purves and his students have presented progress reports at many of the committee meetings and members of the committee have offered suggestions. Dr. Mason and his associates at the Institute have also presented reports on the physical chemistry of fiber suspensions.

Technical Program

A varied technical program which held the interest of those attending the annual meeting, consisted of formal papers and round table discussions. Divided into sessions on many different subjects, the program was as follows:

Enjoying a get-together during the luncheon of the Canadian Pulp and Paper Association are (L to R): R. A. Hayward, president, Kalamazoo Vegetable Parchment Co.; D. W. Ambridge, president, Abitibi Power and Paper Co., Ltd.; and C. H. Sage, president, Spruce Falls Power and Paper Co., Ltd.

Session A—

C. E. Turner, Chairman

Wheat Straw for Improved Paper and Board Products, Dr. E. C. Lathrop, Northern Regional Research Laboratory, United States Department of Agriculture, Peoria, Illinois.

The Board Mill of the Future, Glen Sutton, Sutherland Paper Company, Kalamazoo, Michigan.

Essentials of a Sound Industrial Relations Program, J. Vallillee, The Ontario Paper Co., Limited, Chairman Industrial Relations Section, Canadian Pulp and Paper Association.

Session B—

E. G. Kirby, Chairman

Corrosion of Alkaline Pulping Mill Equipment, F. L. LaQue, The International Nickel Company, Incorporated and K. H. J. Clarke, The International Nickel Company of Canada, Limited.

Wood Handling Equipment at Bathurst, H. W. Buzzell, Dominion Bridge Company, Limited.

Recent Developments in Welded Barking Drums, George M. Dick, Canadian Ingersoll-Rand Company.

Session C—

W. C. R. Jones, Chairman

A New Electronic Sizing Tester, F. W. Elliott, Howard Smith Paper Mills Limited.

Materials Handling in Fine Paper Mills, Harry E. Stocker, Harry E. Stocker Associates, Incorporated, New York, N. Y.

Materials Handling in Specialty Paper Mills, D. D. Hall, The E. B. Eddy Company.

Session D—

F. J. Giffen, Chairman

Steam Jet Refrigeration System for Sulphite Acid Making, W. K. Voss, The Ontario Paper Company, Limited.

Curlated Pulp—A new Approach to Pulp Processing, Dr. H. S. Hill, Dr. J. Edwards, and L. R. Beath, Price Brothers and Company, Limited.

"The Curlator"—Its Application to High Yield Newsprint Sulphite (Preliminary Report), F. P. Silver, Price Brothers and Company, Limited.

Session E—

G. A. Franklin, Chairman

Some Factors Influencing the Accuracy of Mullen Testers, Drs. N. G. M. Tuck and S. G. Mason, Pulp and Paper Research Institute of Canada.

Tensile Strength with a Modified Mullen Tester, R. M. Owen, Abitibi Power and Paper Company, Limited.

Session F—

Dr. J. Edwards, Chairman

Groundwood Mill and Screen Room Heating and Ventilation, S. Clark, Thunder Bay Paper Company, Limited.

Magnesium Cathodic Protection to Inhibit Corrosion of Bronze Facing Wires on Groundwood Deckers, Dr. R. D. Duncan, Canadian International Paper Company.

Session G—

John Buss, Chairman

The Harland Sectional Electric Drive as Applied to Paper Machines, R. J. Spencer-Phillips, Harland Drive Department, Bepco Canada Limited.

Hypothetical Application of a Heat Pump to Paper Machine Dryers, J. P. Woods, Consolidated Paper Corporation, Limited.

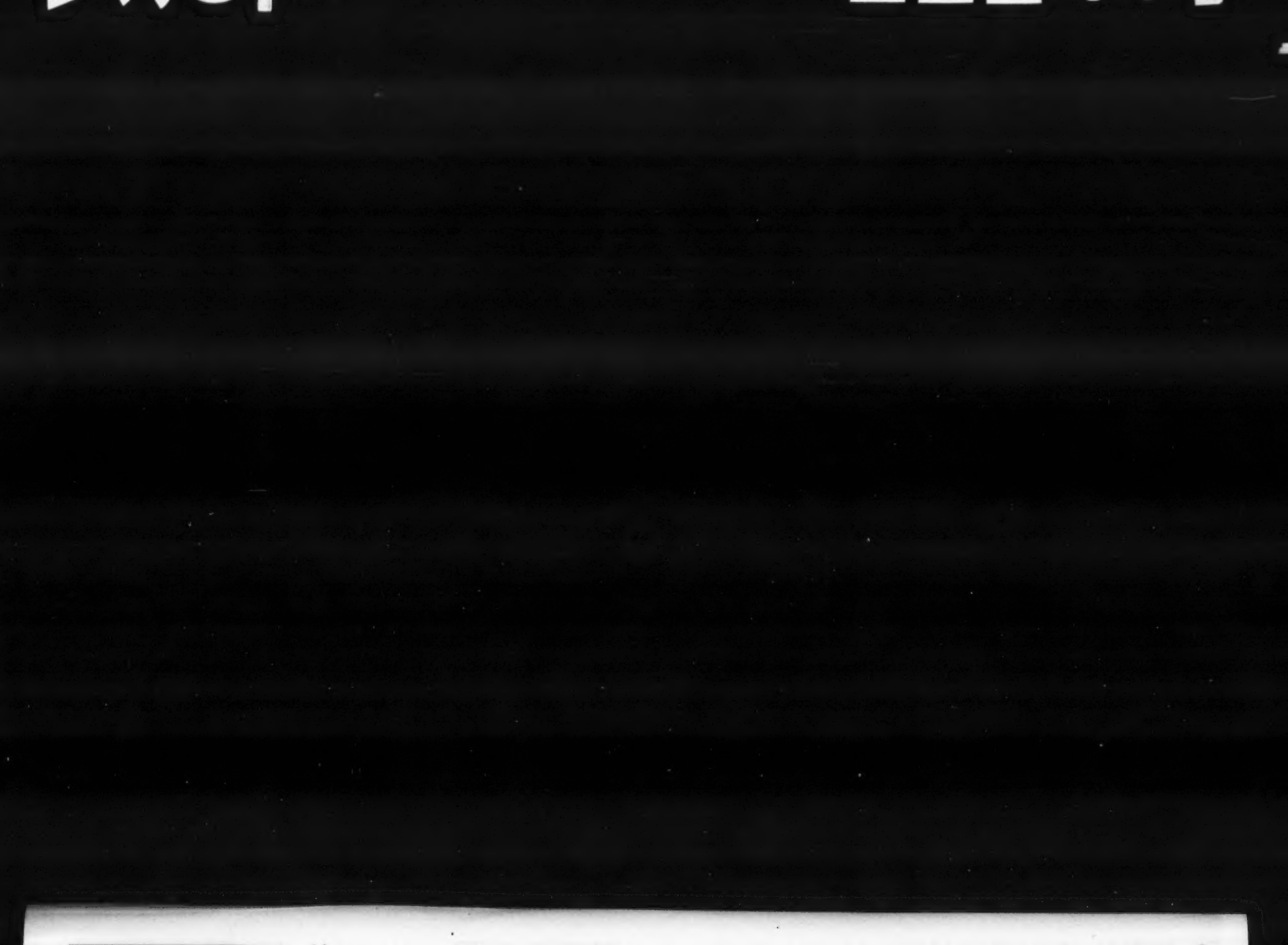
Pioneering with a 60,000 lb. Steam Generating Plant, Fired by a Detroit Rotograte Spreader Stoker on Low Grade Lignite, M. W. Turner, Manitoba Paper Campany, Limited.

Group Discussions

While informal discussions followed the formal papers listed above, a number of subjects were extensively covered at informal meetings or round table discussions. These are listed as follows:

Board: Gloss Ink Printing of Paperboard; Introduced with an informal paper by S. M. Chapman, Pulp and Paper Research Institute of Canada, entitled "Correlation of the Board Committee Test for Surface Oil Resistance of Paperboard with the Results of Gloss Ink Printing."

Mechanical Pulping: Modernization of Smaller Groundwood Mills; Introduced with an informal paper prepared by H. J. Perry, Consulting Engineer, Chatham, New Jersey.



WHAT EVERY PAPER MAKER KNOWS...

No single type of Dryer Felt will suit the requirements of all mills — or even all positions on the same machine.

That is why HOOPERWOOD "Canvas Engineering" has produced not one but several distinct types of Cotton and Asbestos Felts — a service of real assistance to many Paper Mill Superintendents.

If it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an asbestos felt to withstand the advanced temperatures involved in high-speed production of Kraft and other heavy papers — HOOPERWOOD has the felt to fit the need.

Make your next dryer felt *right* — specify HOOPERWOOD.

And for your Carrier Rope requirements, specify HOOPERWOOD-Sheahan Carrier Rope. Until Hooper engineers designed this high-grade product, rope of comparable quality was obtainable only from foreign sources.

WM. E. HOOPER & SONS CO.

New York **PHILADELPHIA** Chicago

Mills: WOODBERRY, BALTIMORE, MD.

HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS

Newsprint: Modernization and Speed Up of Equipment in Newsprint Mills.

Waste: Waste Sulphite Liquor Evaporation (a) General Review of Subject, W. T. Butler, Abitibi Power and Paper Company, Limited; (b) Calcium Sulphite—Sulphate Solubilities, B. B. Gralow, the Ontario Paper Company, Limited; (c) Discussion of Subject.

Alkaline Pulping: Alkali Room Practice (discussion of replies to questionnaire).

Mechanical Pulping: Screening of Mechanical Pulp; Introduced with an informal paper by Dr. J. Edwards, Price Brothers and Company, Limited.

Process Instrumentation: On the Job Training of Instrument Mechanics.

Sulphite: (a) Treatment of Slime with Hypochlorite, Formal paper by R. Stafford, Spruce Falls Power and Paper Company, Limited; (b) Rotary Screening of Sulphite Pulp.

Wood Chemistry: (a) Behavior of of Paper Under Stress and Strain, Formal paper by Dr. Borje Steenberg, Swedish Forest Products Research Laboratory, Stockholm, Sweden; (b) The Swedish Forest Products Research Laboratory, an informal description by Dr. Borje Steenberg.

Board: Drying of Paperboard — (Discussion of replies to questionnaire).

Fine Papers: Discussion of Maintenance and Operating Problems, (a) Stock Preparation; Led by W. C. R. Jones, Howard Smith Paper Mills, Limited; (b) Paper Machines, Led by R. C. Mode, Provincial Paper Limited; (c) Maintenance, Led by W. E. Rice, Canada Paper Company.

Heat and Power and Newsprint: The New Newsprint Machine at Powell River; Formal paper by F. R. Riley and H. B. Urquhart, Powell River Company, Limited, followed by a panel discussion including representatives of Bepco Canada Limited, Harland Drive Department; Dominion Engineering Company, Limited, and Ross Engineering of Canada, Limited.

Wood Chemistry: A Symposium of Papers on Hemicelluloses; (a) The Chemistry of Hemicelluloses, Dr. Louis E. Wise, The Institute of Paper Chemistry; (b) The Isolation and Fractionation of White Birch Holocellulose, Dr. Dennis A. Sitch, Ontario Research Foundation; (c) The Effect of Hemicellulose Content on the Physical Properties of Pulps, Dr. J. H. Ross, Donald Ross and Company.

C. F. Sisson, assistant manager, MacSimBar Paper Co., Otsego, Mich. (left); Maxwell D. Bardeen, president, Lee Paper Co., Vicksburg, Mich. (center); and L. R. Verdon, general manager and vice pres., American Cyanamid Co. (right)

George H. Gerpheide, president, Hawthorne Paper Co., Kalamazoo (left); George N. Carleton, president, Detroit Sulphite Pulp and Paper Co., Detroit (center); and Andrew Aldrich, unloading foreman, Kalamazoo Vegetable Parchment Co. (right)

Associations Hold Joint Get-Together at Kalamazoo

▶▶▶ THE LARGEST gathering of paper mill men from the Kalamazoo Valley in the history of a decade and a half of annual joint meetings turned out for the January 16 event here at the Hotel Harris. It was the 16th recorded, and the 27th unofficial gathering of the Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry and the Michigan division of the American Pulp and Paper Mill Superintendents Association.

William Race, president of the Sutherland Paper Company, was toastmaster for the program that followed the dinner, which was served to 407 men of the trade. M. J. Schulenburg, director of public relations for Kimberly-Clark Corporation, Neenah, Wisconsin, spoke for Cola G. Parker, president of the concern, who had accepted the invitation to address the gathering. Mr. Parker was prevented from attending by the death of his father, George Parker, in Anderson, Indiana, the Friday previous.

Principals at the annual get-together of the Kalamazoo Valley Section of TAPPI and the Michigan Division of the Superintendents Association: Left to right—M. J. Schulenburg, director of public relations, Kimberly-Clark Corp., Neenah, Wis., who presented paper prepared by Kimberly-Clark President Cola G. Parker; Paul W. Bartholomew, TAPPI section chairman and presiding officer of the evening; William Race, president of Sutherland Paper Co., who was toastmaster, and Herbert Johnston, chairman of the Michigan Division of the Superintendents Association. Messrs. Johnston and Bartholomew were co-chairmen of the event

Among guests from outside the Valley were Werner Kaugmann, with Kupfer Brothers Company, Chicago, national chairman of TAPPI's coating committee and recently elected national TAPPI committeeman; Robert B. Wolf, New Canaan, Connecticut, consultant to the Weyerhaeuser Timber Company, and George N. Carleton, president of the Detroit Sulphite Pulp and Paper Company.

Paul W. Bartholomew, chairman of the Kalamazoo Valley Section, presided. Mr. Bartholomew and Herbert

Johnston, chairman of the Michigan division of the Superintendents Association, were co-chairmen of the general arrangements committee. Chairmanship of the joint sessions alternates between the chairmen of the two sponsoring organizations.

Mr. Race presented past chairmen of the two organizations. Then he gave recognition to a number of men prominent in the profession. Among them were A. L. Sherwood, vice president of the Sutherland Paper Company and TAPPI national committeeman; Glen Sutton, Sutherland superintendent and fourth vice president of the Superintendents Association; Werner Kaufmann and Alfred H. Nadelman, Western Michigan College's pulp and paper technology course director.

Mr. Parker's paper, "What Price Freedom?" was based on the thesis that freedom is endangered. "Not the least of the perils," he stated, "is apathy—refusal to face the facts—the effort to load on government all the burden of individual care—the failure to recognize that while power in private hands is dangerous, unlimited power in the hands of the government is inevitably fatal to freedom."

His paper then narrowed the field treated to "the inherent conflict between freedom and security and the danger to freedom in security at the hands of the state."

Mr. Parker said he did not criticize the search for security but placed the desire for freedom above it in the list of incentives for advancement. He defended the search for security "if individuals are to be guaranteed complete security—by a government capable of making good its guarantees."

Then he cited his story to prove that wherever the government provided full security "there always came a lowering of the standards of living and ultimate collapse—with the people finding they had surrendered their liberties for the promise of security and even that—except the security of slaves—had disappeared."

He warned then that while national security was essential and worth spending money for, excess zeal in this field and in the securing of benefits for all the world can only lead to losing all that has been gained in the 160 year battle of the Republic:

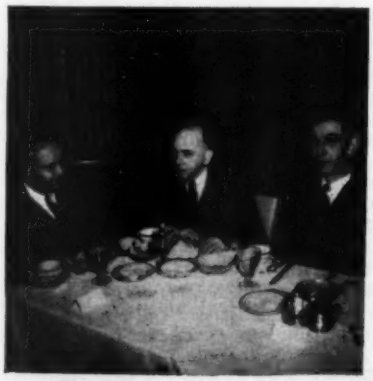
"In the last analysis," he continued, "no person's security can exceed his own self reliance."

Mr. Parker assailed the promises of the last campaign which he said included "continued high prices for farmers," "lower food prices to city dwellers," "higher wages for labor" and "higher and more social security."

Where the money for this "contradictory program" will come from was claimed to be from corporate taxes and the old policy of "soaking the rich."

Then he voiced a defense of corporate profits which he said "are being attacked most viciously," and which are "a necessity if there is to be any individual security for anyone connected with the business."

He declared it is the responsibility of everyone in business to speak out in defense of the profit system, "and not at all apologetically, for you know that without fair profits we could not have expanded our capacities in all businesses so as to be able to produce all the things people need and want."



Alfred H. Nadelman, director of pulp and paper technology course at Western Michigan College, Kalamazoo (left); Werner Kaufman, Kupfer Bros. Co., Chicago, and national TAPPI Committeeman (center); and A. L. Sherwood, vice president Sutherland Paper Co., and national TAPPI Committeeman

Harry Williamson Talks Before Joint Meeting of Miami Valley Supts. Ass'n and Ohio TAPPI

▶▶▶ A JOINT meeting of the Miami Valley Division of the American Pulp and Paper Mill Superintendents Association and the Ohio Section of the Technical Association of the Pulp and Paper Industry was held January 15 at the Hotel Manchester in Middletown, Ohio. The meeting was well attended, about 106 being present.

The main speaker at this meeting was Harry F. Williamson, who addressed the group on "Stock Preparation and Its Effect on Formation."

Mr. Williamson outlined the four major functions in making a sheet of paper: (1) Selection and proportioning of the different pulps in the furnish, which also includes the mechanical conditions necessary to develop the pulps; (2) the evaluation of the liquid and formation of the fibers into sheets; (3) drying or evaporation of the surplus moisture; (4) finishing operations.

In reviewing briefly the mechanical developments of the fourdrinier and cylinder machines, the speaker recalled that in 1927 the double head-box was developed for making special grades on the fourdrinier machine. He stated that consistency of the stock in the fourdrinier head-box should never be over 0.5 per cent, and best formations are obtained at the lower values. On a cylinder machine, best formation is obtained at a consistency of 0.1 per cent to 0.2 per cent, while using the proper mesh wire.

There are four important factors to consider in making a sheet of paper. They are: (1) long fibers, which are the reinforcing steel rods in the paper, (2) short fibers, which are the bricks and mortar, (3) slow stock, and (4) fast stock.

In Mr. Williamson's ideal paper mill, he would have a separate refining system for each different type of fiber (sulphite, soda, kraft) that he expects to use. These pulps would be separately refined to 90% of their inherent value before blending in the beater. By inherent value of a pulp, we mean the point where maximum Mullen is developed without too great a falling off of Elmendorf. Also where fold and stretch are at their peak. Going beyond this point, one will get again a hard brittle, low tear sheet.

The speaker recalled some of his experiments in which he developed a highly hydrated pulp by subjecting it to high pressure. This gave a glassine type sheet in all appearances, but the strength (tear and burst) were about the same as that of the raw fibers. In other words, beating (mechanical treatment) is the only way to develop strength of a pulp.

More recently Mr. Williamson has conducted a series of experiments in which a cylinder mold one foot wide was so constructed that a sheet of paper was formed on the mold under a predetermined pressure.

Different tests were performed on a variety of pulps in which each pulp was refined a standard amount, then formed on the cylinder at a standard pressure. The speed of the cylinder was run at increasing speeds until the centrifugal force prevented the fibers from sticking to the mold.

Then similar experiments were tried on the same pulp that had been refined to 100 per cent of its inherent value.

Thus, the maximum speed that the cylinder could be run and still form a sheet of paper was determined for each different type of pulp.

At present a larger cylinder, 72 inches in width is being built, but instead of using pressure, suction will be utilized. Speeds as high as 3000 fpm are a possibility.

During the spirited discussion that followed Mr. Williamson's talk, he very generously answered a number of questions brought up concerning problems that confront many papermakers.

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▶▶▶ NINE PAPERS on nonstandard analytical methods were given at the January 18 meeting of the Pacific Section of TAPPI, held in Bagley Hall, University of Washington, Seattle. Dr. E. Gray King was moderator. President of the University, Dr. Raymond Allen, spoke at the dinner meeting, held in the evening. Harold Wall, of Longview, and Dr. Joseph McCarthy, of Seattle, helped arrange details of the session.

▼

PAPER MILL EXECUTIVES ON NAM BOARD OF DIRECTORS

Three executives prominent in the paper industry have begun a year of service to the National Association of Manufacturers as 1949 members of the NAM board of directors. Their election became effective during the 53rd annual Congress of American Industry held annually by the NAM. The last meeting took place in December in New York City.

The men elected to serve as NAM directors in their respective states are: Oregon—F. N. Youngman, vice president, Crown Zellerbach Corporation, Wisconsin—Cola G. Parker, president, Kimberly-Clark Corporation (re-elected), South Carolina—James L. Coker, president, Sonoco Products Company (re-elected).

▼

▶▶▶ THE NEW PRESIDENT of the Wisconsin Paper Group is Douglas G. Hyde, of the Marathon Paper Co., Menasha. Other officers elected include H. G. Wake, Wisconsin Rapids, vice president; Leo O. Schubart, Neenah, secretary-treasurer; and Irwin Pearson, Neenah, renamed executive secretary.

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▶▶▶ AN INTERNATIONAL pulp conference will be held at the Windsor Hotel in Montreal on April 25. The conference, which will be attended by delegates from the principal pulp-producing countries, is sponsored by the Food and Agricultural Organization of the United Nations.

FOURTH ANNUAL MEETING OF INSTRUMENT SOCIETY WILL BE HELD IN TORONTO

The Instrument Society of America will hold its fourth annual spring meeting at the Royal York Hotel, Toronto, Canada, May 12 and 13 according to an announcement by Ed Grace, chairman of the National Meetings Committee and chief instrument engineer of the Sun Oil Company.

The tentative program, under the direction of Lyman Allen, Jr., will include four technical sessions and a dinner on Thursday evening, May 12th. Mr. Allen is chairman of the Papers Subcommittee of the National Meetings Committee and assistant design engineer, American Viscose Company. The meeting will be of interest to all engineers engaged in measurement, inspection, testing and automatic control.

▼

▶▶▶ AWARD FOR the best exhibit at the 3rd National Materials Handling Exposition, held in Philadelphia January 10-14 went to the Industrial Truck Division of the Clark Equipment Company, Battle Creek, Michigan. The trophy was a sterling silver bowl, and it was presented to James H. W. Conklin, sales manager for the Clark company. He in turn presented it to the company's advertising manager, Russell F. Oakes, whose responsibilities include production and operation of exhibits.

▼

WALLBOARD CONFERENCE TO BE HELD NEXT FALL AT HARVARD UNIVERSITY

A conference, on the subject of wallboards, their technology and economics, and believed to be the first one of its kind, is to be held September 16 in Cambridge, Massachusetts. It is sponsored by the Northeastern Wood Utilization Council with the co-operation of Harvard University. The co-operating faculties at Harvard will be from the Graduate School of Engineering and the Graduate School of Business Administration.

Wallboard production has increased tremendously both here and abroad, but the types have been limited and the demand for many types is unsaturated. Both softboards and hardboards will be covered at the conference, and the production of wallboards from wood wastes, such as edgings, shavings and sawdust, will be stressed. There has been extensive research and development work on the subject, and it is believed that the chemical problems have been solved. However, commercial realizations have been very few. Therefore, the emphasis at the conference will be on the engineering and economic phases of the subject.

Among the commercial products to be discussed will be the following: "Novopan," "Interwood," "Beirec," Smith-Othmer board, the E. T. H. (Swedish) board, Plaswood, Chapman, Laucks-Monsanto, and several others.

Descriptions of commercial units operating in this country, Canada, and in Europe will be included in the papers to be given. Both the "wet" processes, going through pulping, and the "dry" processes, which compress sawdust or other waste in a substantially dry form, will be looked into. Relative merits of various adhesives, ranging from oils and starches to synthetic resins; continuous methods of manufacture; properties of the final boards; uses and substitutes; availability of raw materials; and a market survey of the potential demand will be some of the other problems discussed.

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COMING EVENTS

Mar. 17—Regular meeting of Michigan Division of the Superintendents Association, at Hotel Harris, Kalamazoo.

Mar. 22—American Society for Testing Materials, Philadelphia District. Franklin Institute.

Mar. 24—TAPPI (Delaware Valley Section), Engineer's Club, 1317 Spruce St., Philadelphia.

Apr. 4-6—National Paper Trade Ass'n, Annual Convention, Waldorf-Astoria, New York City.

Apr. 8—TAPPI (Pacific Section) will meet in Longview, Wash.

Apr. 11-14—National Ass'n of Corrosion Engineers, Fifth Annual Conference and Exhibition, Netherlands Plaza Hotel, Cincinnati, Ohio.

Apr. 28—TAPPI (Delaware Valley Section), Engineer's Club, 1317 Spruce St., Philadelphia, Pa.

May 10-13—Eighteenth National Packaging Exposition, Public Auditorium, Atlantic City, N.J.

May 26—TAPPI (Delaware Valley Section), Engineer's Club, Philadelphia, Pa.

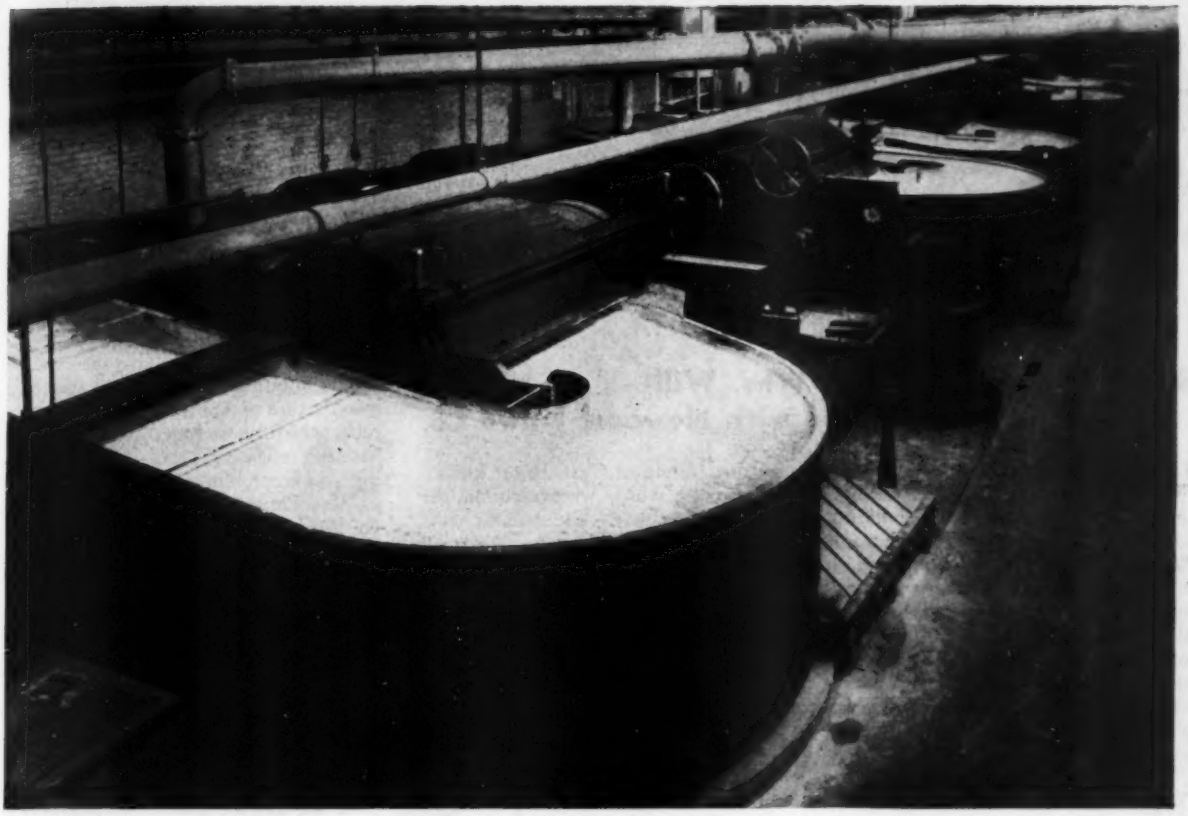
June 8-9—General Management Conference, American Management Ass'n, New York City.

June 15-17—Annual convention of the Superintendents Association will be held at Chalfonte-Hadden Hall, Atlantic City, New Jersey.

Sept. 16—Conference of Northeastern Wood Utilization Council on Wallboards will be held in Cambridge, Mass., with the cooperation of Harvard University. Attendance limited to 75. Obtain invitations by writing E. L. Heermance, Sec., Northeastern Wood Utilization Council, New Haven 6, Conn.

Oct. 25-28—National Safety Council, 1949 National Safety Congress, Chicago.

Nov. 1-5—Pacific Chemical Exposition, California Section, American Chemical Society, Civic Auditorium, San Francisco, California.



3 to 5 times THE WORK WITH MIDWEST AUTOMATICS

Except for superficial appearance these six Midwest automatics are as different from ordinary beaters as day is from night.

These six beaters are doing from 3 to 5 times the work of which ordinary beaters are capable—processing around 50 tons each. Five of them are ahead of five machines running a wide range of specialty papers, each beater serving its own particular machine. The sixth is a spare.

Each succeeding furnish, for a given grade, is an exact duplicate of all previous furnishes for that grade. Any earlier furnish required for some other grade may be duplicated exactly. That is all controlled automatically, a feature not found on ordinary equipment.

The power saving is truly tremendous. In a conventional beater most of the power is used to circulate the stock. In a Midwest automatic most of the power is used for work on the stock, relatively little for circulation.

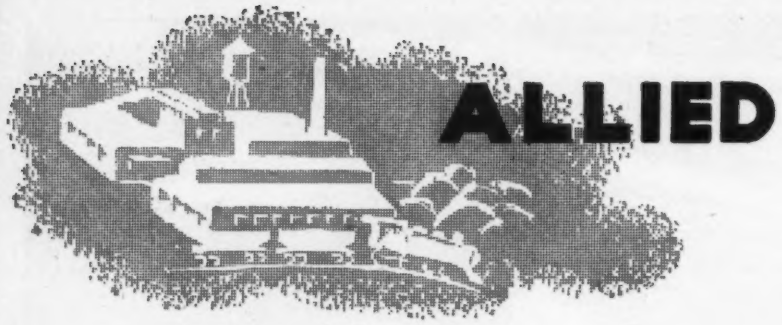
Since one Midwest automatic will do the work of 3 to 5 ordinary beaters, the initial investment per ton of capacity is bound to be lower. As for maintenance, there has been virtually none on the beaters mentioned above and they've been operating several years. The saving in floor space is obvious.

Here is a beater capable of beating all the stock a 112″ or 116″ machine can use—a beater that would save you money—far more money than you may at the moment realize. Let us give you *all* the facts.

MIDWEST-FULTON
DRYER DRAINAGE SYSTEMS
MIDWEST PULPERS
STANDARD BEATERS
AGITATION EQUIPMENT
AUTO-FLEX DRYER SYPHONS
BALL
SIGHT-FLOW INDICATORS, ETC.

THE MIDWEST-FULTON MACHINE CO., Dayton 1, Ohio

Midwest-Fulton



Sandy Hill Iron & Brass Wks. Will Collaborate with Newport News Co.

▸▸▸ The Sandy Hill Iron and Brass Works of Hudson Falls, New York, and the Newport News Shipbuilding and Dry Dock Company of Newport News, Virginia, have completed a transaction, according to an announcement now being circulated, whereby they will collaborate in the manufacture of industrial equipment. The arrangement will provide customers of either concern with the benefits of the engineering talent and manufacturing facilities of both companies.

The Sandy Hill Iron and Brass Works is this year celebrating its 90th anniversary as a manufacturer of pulp and papermaking equipment. During the past year, Sandy Hill-built-and-designed papermaking equipment has been shipped to Mexico, Holland, South Africa, China and South America. At the present time, Sandy Hill engineers are supervising the erection and placing in operation of four complete papermaking machines in South America.

In 1880, when the Chesapeake and Ohio Railroad built an extension to deep water at Newport News, that settlement was only a hamlet, but it was within a stone's throw of Hampton Roads, where all the navies of the world could ride at anchor. It was a natural site for a shipyard, and so here began what was in a few years to become one of the greatest shipbuilding and drydock areas in the world.

A glance at the names of the vessels launched from the Newport News yards reads like a roster of the United States Navy: The aircraft carrier Hornet, the cruiser St. Louis and her sister ship, the Boise, the aircraft carrier Yorktown and the carriers Enterprise and Ranger, the great USS Essex and the battleship USS Indiana are only a few.

The first collaboration between the Hudson Falls company and the Newport News group came during World War II. The Sandy Hill Iron and Brass Works built many of the Johnson Stern Anchor Handling Gear, better known as winches, which were used on the LST landing craft—the famous craft which after the war were called the Allies' secret weapon.

Previous to completion of the present agreement with the Newport News organization, many of the largest castings used in the paper machines designed at Sandy Hill had to be bought elsewhere, in foundries making the very largest castings. Machine work on some of these castings, the weight of which reached 40,000 pounds, also had to be sub-contracted. Under the present arrangement, castings too large for Sandy Hill, and machining beyond the range of tools in the Hudson Falls shop, will be handled by the shipbuilding firm where tremendous machines and foundry capacity are part of their stock in trade.

It is expected that, as a result of this collaboration, great benefits may be extended to the purchasers of heavy machinery in the fields already served by the two companies and to users of heavy machinery in fields where their technical skills and engineering capacity may lead the co-operating companies to make offerings in the future.

Extensive plans for the interchange of orders, designs and work on shipbuilding, hydraulic, paper and pulp mill and many other types of heavy machinery are in progress. As these designs are approved by potential customers and become orders, the arrangement will work out to the advantage of both companies and the communities in which they are located.

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GILBERT AND NASH MAKE CONTRACTUAL AGREEMENT WITH APPLETON MACH. CO.

According to the terms of a contractual agreement with the Gilbert and Nash Company of Menasha, the Appleton Machine Company, Appleton, Wisconsin, has been designated as sole manufacturers of Gilbert and Nash Wire and Felt Guides. The change was effective on January 1. This well-known line of automatic guiding equipment for the paper industry will continue to be manufactured under the firm name of Gilbert and Nash as a division of the Appleton Machine Company.

There will be no change in the Gilbert and Nash organization, and C. O. Baetz will continue with the Appleton Machine Company. Sales will be handled through Gilbert and Nash with Appleton sales engineers and sales representatives acting as selling agents.

The building formerly used for the manufacture of Appleton supercalender rolls, which was vacated late in 1948, has been refitted and tooled for machining and assembling the wire and felt guides. Finished and unfinished parts on hand have been transferred from Menasha. A complete stock of replacement parts is carried at all times.

Communications may be directed to Gilbert and Nash, Menasha, as before, or to Gilbert and Nash Division of the Appleton Machine Company, Appleton, Wisconsin, telephone, Appleton, 3-7361.

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NEW FIBER STRAPPING WILL BE MADE BY INDIANA CO.

A new company, incorporated as The Simonite Company, of Bedford, Indiana, will produce a fiber strapping tradenamed *Simonite*. The plant capacity will be set up to make 800 miles of strapping in 16 hours; the annual production will be enough to go around the earth at the equator eight times—according to the announcement.

The company is headed by L. A. Simons, who invented Simonite in 1931. It was first used in the manufacture of furniture.

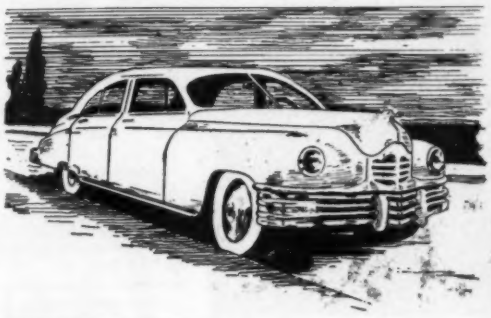
▼

COMBUSTION ENGR. AND SUPERHEATER MERGER IS APPROVED BY STOCKHOLDERS

The official merger of two well-known power equipment manufacturers became effective December 31, 1948 under the new name of Combustion Engineering-Superheater, Inc. On December 22 the stockholders of both companies approved the transaction.

The two companies became affiliated in 1933, and since then it has become increasingly evident that important advantages could be obtained by merging all operations under a single management.

The new company will continue the world-wide activities of the present companies in the manufacture and installation of steam generating and as-



1. Is this an au-to-mo-bile?
Yes, this is an au-to-mo-bile.
It is a fine au-to-mo-bile and

POWELL VALVES

helped to make every part of it.

American Industry has gone a long way since McGuffey compiled his First Reader in 1836. But Powell Valves have matched every step in its progress.

Literally, Powell Valves help to make everything that goes into the modern automobile. Because, whether it be motor, transmission, chassis, body, plastics, finishes, tires, anti-freeze, battery, gasoline or any other processed item, there are Powell Valves exactly suited to control the flow of all media used in their production.

This automobile merely illustrates the completeness of the Powell Line. The important point is that, no matter what *your* product may be, there are Powell Valves especially adapted for each and every one of your flow control services.

Fig. 1793—Large 125-pound Iron Body Bronze Mounted Gate Valve with outside screw rising stem, bolted flanged yoke and tapered solid wedge. Also available in All Iron for process lines.

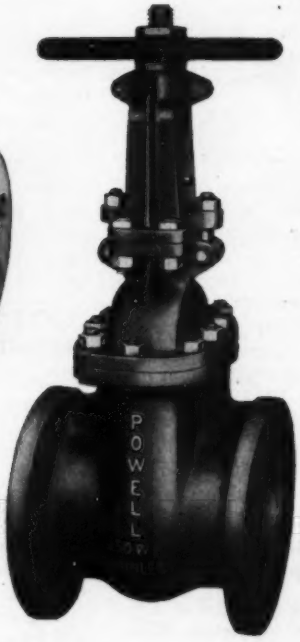


Fig. 2453-G—Large 150-pound Stainless Steel Gate Valve with bolted flanged yoke bonnet, outside screw rising stem and tapered solid wedge. →

Fig. 3003—Class 300-pound Cast Steel Gate Valve with flanged ends, bolted flanged yoke, outside screw rising stem, tapered solid wedge.

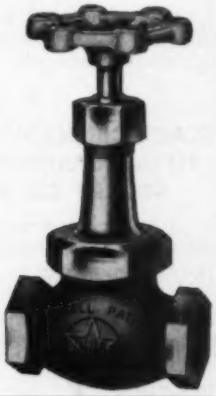


Fig. 1708 — 200-pound Bronze Globe Valve with screwed ends, union bonnet, renewable, specially heat treated stainless steel seat and regrindable, renewable wear-resisting "Powellium" nickel-bronze disc.

The Wm. Powell Company
Cincinnati 22, Ohio
DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

sociated products, and such equipment as chemical recovery units for pulp mills; flash drying systems for a wide variety of materials; sewage incineration systems; mills for pulverizing products of the process industries generally; soil pipe and castings; and domestic water heaters and range boilers.

Heading the officers of the new company are: Frederic A. Schaff, chairman of the board; Samuel G. Allen, chairman of the executive committee; and Joseph V. Santry, president.

▼

OAKITE PRODUCTS MARKS ITS 40th ANNIVERSARY

This month marks the completion of forty years in business for Oakite Products, Inc., pioneers in the field of industrial cleaning materials and methods. The increasing use of its products and methods by industrial plants can be directly traced to the company's "fundamental policy of rendering a service and selling a product on the side," according to the general manager, John A. Carter.

In support of this policy, the company maintains a nationwide field service organization of 180 experienced technical representatives to provide in-plant assistance and to assure the most economical application of its materials. They supply more than 80 specialized compounds for cleaning and related operations in the pulp and paper field.

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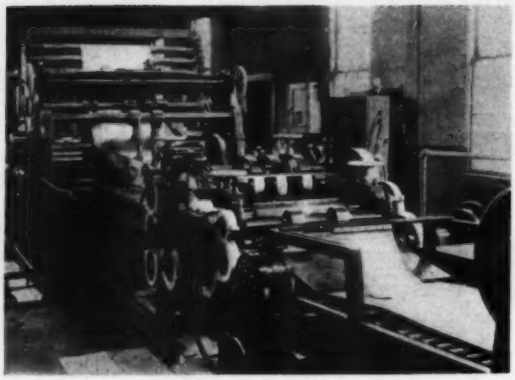
BLACK-CLAWSON LICENSED TO MANUFACTURE AND SELL KOHLER CO.'S EQUIPMENT

Exclusive license for the manufacture and sale of the Kohler System Company's Equipment has been given to The Black-Clawson Company, Hamilton, Ohio. The agreement effecting this negotiation was dated January 17, and it applies throughout the world except in Canada.

The Kohler equipment consists of apparatus for winding and unwinding web materials under controlled tension, without stops or slowdowns for roll changes. In addition to its uses in the papermaking and printing industries, Kohler equipment has had long and wide application in such fields as plastics and sensitized film.

In view of Black-Clawson's extensive activities in the manufacture of machinery for the paper industry, the acquisition of the Kohler line is logical. Carrying the logic still further, the Kohler line is a natural supplement to the Dilts "family tree" of converting machinery. Therefore the manufacture of Kohler equipment will be carried on by the Dilts Division. Thus Dilts will be able to supply complete conversion machines with winding and unwinding apparatus for continuous operation. These single-package units will give purchasers the benefit of undivided responsibility with respect to design and manufacture.

As heretofore, the Kohler System line will be available for application to printing presses, supercalenders, coaters, paper machines, etc., of all makes. The entire engineering organization of the Kohler System Company will be moved to Dilts Machine Works, Fulton, New York, at an early date. The Chicago office of the company will be maintained for the present.



Shown here is one of the latest 3-wall Tubers for satchel bottom bags, built by the Smith & Winchester Mfg. Co., So. Windham, Conn., and installed in the Wellsburg, W. Va., plant of the Hammond Bag & Paper Co. This machine is equipped with the latest cross pasting units, electric eye controlled compensator for keeping the printing of pre-printed rolls in register with the cut off, and special drive which eliminates any change gears.

▼

▶▶▶ THE HOME OFFICES of the Pittsburgh Corning Corporation have been transferred from the Pittsburgh Plate Glass Building to 307 Fourth Avenue, Pittsburgh. These larger quarters will enable the firm to better serve buyers of its two products, structural glass blocks and cellular glass insulation. Although the address is to be changed, the corporate organization remains the same. In 1937, Pittsburgh Corning was formed by the Corning Glass Works and the Pittsburgh Plate Glass Company. It was capitalized on a 50-50 basis.

▼

FOXBORO CO. OPENS BRANCH OFFICE IN APPLETON, WIS.

A new branch office located at 123 W. College Avenue, Appleton, Wisconsin, is announced by The Foxboro Company, Foxboro, Massachusetts. The manager of the new office is Milton A. Schreiner, who has been associated with the company since 1922, principally in the Midwest. Mr. Schreiner has specialized on instrument problems in the pulp and paper industry and is widely known among the mills of Wisconsin and Minnesota.

Two other offices recently opened by Foxboro are: Kansas City, Mo., where George J. Willier is manager; Baton Rouge, Louisiana, with John B. Deaderick as manager.

SERVICE PINS AWARDED WHEN ATKINS "PIONEERS" GATHER FOR 43RD DINNER

The forty-third annual dinner and entertainment of the Twenty-Year Service Club, of E. C. Atkins and Company, Indianapolis, Indiana, took place January 29 at the Hotel Severin Roof Garden. Approximately 400 Atkins "Pioneers," enjoyed this event.

Following the dinner, new officers were introduced and new members welcomed. Elias C. Atkins, President of the company and honorary president of the Club, spoke. Eleven men received pins for service ranging from 50 to 60 years. New members had received their 20-year pins at a recent business meeting, and 45 other Pioneers were presented with exchange pins for additional 5-year service periods.

▼

"LIFTS" IS NEW MAGAZINE ISSUED BY HYSTER COMPANY

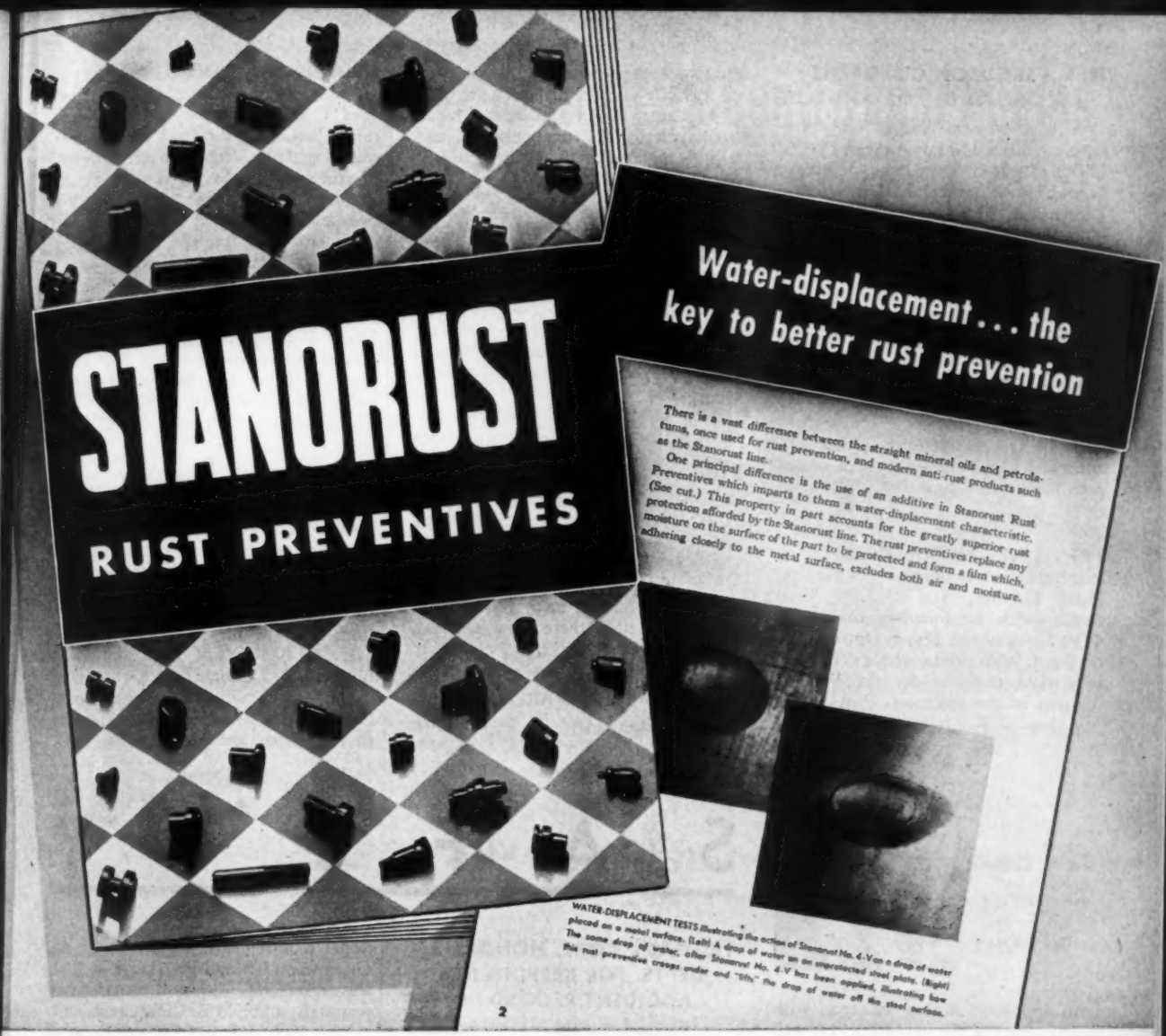
The first issue of a new external company magazine has just been sent out by the Hyster Company, of Portland, Oregon, and Peoria and Danville, Illinois.

This magazine is called *Lifts*, and it is distributed through Hyster truck dealers in the United States, Canada, and 50 foreign countries, with a controlled circulation of 50,000.

The first issue contains 36 pages of articles and departments on the subject of materials handling problems and their solution through the use of various types of industrial trucks. The appearance is enhanced by the use of color.

▼

▶▶▶ A DISTRICT sales office has been opened in Appleton, Wisconsin, by the Pennsylvania Salt Manufacturing Company, Philadelphia, for its Heavy Chemicals Division. C. H. Anderson, of Pennsalt's Chicago office, has been placed in charge as district sales manager.


STANORUST
RUST PREVENTIVES
Water-displacement . . . the key to better rust prevention
There is a vast difference between the straight mineral oils and petrolatums, once used for rust prevention, and modern anti-rust products such as the Stanorust line.
One principal difference is the use of an additive in Stanorust Rust Preventives which imparts to them a water-displacement characteristic. (See cut.) This property in part accounts for the greatly superior rust protection afforded by the Stanorust line. The rust preventives replace any moisture on the surface of the part to be protected and form a film which, adhering closely to the metal surface, excludes both air and moisture.
WATER-DISPLACEMENT TESTS illustrating the action of Stanorust No. 4-V on a drop of water placed on a metal surface. (Left) A drop of water on an unprotected steel plate. (Right) The same drop of water, after Stanorust No. 4-V has been applied, illustrating how this rust preventive creeps under and "lifts" the drop of water off the steel surface.
2

Here's the answer to your rust prevention problems

THE BOOKLET illustrated above holds the means to more complete and more economical rust control in your plant. It will help you analyze your rust prevention problems and needs. It tells how the new, improved Stanorusts now fully meet these needs.

The eight grades of Stanorust are described. They range from a fingerprint remover to a heavy, petrolatum-type product that protects against corrosion under the most severe outdoor exposure for years.

Find out why Stanorusts can mean big savings for you through better rust protection. Send for this booklet. Write for your copy today. Simply address your letter to Standard Oil Company (Ind.), 910 S. Michigan Ave., Chicago 80, Ill.

Send for a copy

STANDARD OIL COMPANY (INDIANA)

STANDARD

H. K. FERGUSON CO. OPENS AN OFFICE IN LOS ANGELES

A new western district office has been established in Los Angeles by The H. K. Ferguson Company (Cleveland, New York, Houston and Cincinnati). Located at 712 Curson Street, this office will be managed by Henry Maag, a contract engineer with Ferguson for the past 22 years.

The Ferguson company states that the Los Angeles office has been established to supply the increasing demand for industrial engineering and building services in that area. The company has been engaged in West coast industrial expansion programs for the past three decades. It is celebrating its thirtieth anniversary and employs a staff of approximately 700 engineers.

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▶▶▶ A NEWLY-FORMED sales district has been announced by the Peerless Pump Division, Los Angeles, California, with headquarters located at 4330 Leavenworth Street, Omaha, Nebraska. J. W. L. Stone, who was formerly a field engineer for the Peerless division in the southwest district, has been appointed district manager, with headquarters at the new office. He will now supervise the sales of both the Peerless horizontal and vertical lines and other pumps of the company's manufacture.

J. W. L. Stone

▼

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP. TO BUILD NEW DISTILLATION PLANT

Announcement has been made by the Pennsylvania Industrial Chemical Corporation, Clairton, Pennsylvania, of plans for the erection of a new $1,000,000 distillation plant on a 5-acre site near West Elizabeth, Pennsylvania.

The firm expects to complete in about six months the installation of an entire distillation unit for the separation of precision fractions of aromatic oils, one of the initial processes in the development of resins. These resins are used in paper, rubber, textile, floor covering, paint and varnish, adhesive, and other industries.

Erection of the distillation unit is the first step proposed by the company in its long-range expansion program for this area. The new plant will be an auxiliary to the Clairton operations, and will be operated by the Clairton organization.

▼

GOODRICH TO OPEN NEW CHEMICAL PLANT AT AVON LAKE IN A FEW MONTHS

The first unit of the new $3,000,000 general chemicals manufacturing plant of B. F. Goodrich Chemical Company, Avon Lake, Ohio, is scheduled to start operations.

New plasticizers for vinyl and synthetic resins will be the first products manufactured. The pilot plant at Avon Lake already has made available to industry trial quantities of the new plasticizers. A number of general chemicals will be produced at the new plant, including Beta-Propiolactone, a most reactive chemical, which makes possible the manufacture of many other chemicals for which there now exists a latent demand.

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▶▶▶ SERVICE AWARDS were given early in the year by the Pennsylvania Salt Manufacturing Company, Philadelphia, to employees for 20, 15, 10 and five-year service records. Leonard T. Beale, company president, received his service pin from Y. F. Hardcastle, vice president in charge of manufacturing, who has been with Pennsalt service for 40 years. Following his own award, President Beale made the presentation of awards to 43 other members of the organization.

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▶▶▶ THE EXCLUSIVE SALE of Evans Rotabelt Suction Unit in the United States and Canada has been given to Paper and Industrial Appliances, Inc., New York, N.Y., by W. P. Evans & Sons, Ltd., of Clifton, England.

▼

▶▶▶ WAREHOUSING facilities were established recently at Albany, New York by National Aluminate Corporation, of Chicago. Pulp and paper mill slime treatments, industrial water treatment chemicals, and the new Nalco soot remover chemical ST-150 will be stocked there for faster delivery to users in New York State and New England. R. I. Moran, district manager in the territory served by the new warehouse, will be assisted by E. A. Clausen, C. T. O'Brien, and J. F. McCoy.

S A F E T Y

TAGGART CORP. HONORS 3 DEPTS. FOR KEEPING NO-ACCIDENT RECORD IN 1948

A banquet on January 25 honored approximately 40 members of three departments of the Herring (N.Y.) mill of Taggart Corporation in recognition of a perfect safety record for 1948. The departments honored were: spiral tape, steam and electric, and repair departments.

Among the guests of honor were W. R. Adams, vice president of the St. Regis Corporation, and C. C. Wenzel, personnel manager of the Taggart Corporation.

▼

TIME TO ENROLL IN BASIC SAFETY TRAINING COURSE AT NAT'L SAFETY COUNCIL

A five-day course in the fundamentals of industrial safety is offered each year by the National Safety Council, Chicago. The course is offered at least five times, November through June, and any employee of a Council member is eligible to enroll. Each class is limited to 18. There are no educational requirements, no experience requirements. The tuition charge is $50, which includes the cost of reference materials supplied to each participant.

This Basic Safety Training Course is conducted at the Council's headquarters in Chicago. Each course lecturer is an expert in the particular phase of safety he discusses. One week, of course, is not sufficient time to learn all there is to know about conducting a safety program. The main purpose of the course is to provide a solid foundation of safety knowledge. An advanced course is available to those who have completed the Basic Course. An inquiry addressed to the Training Course Director, National Safety Council, 20 North Wacker Drive, Chicago 6, Illinois, will bring circular and enrollment blank.

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SAFETY CONTEST SCORES

▶▶▶ INJURY RATES in the paper industry safety contest suffered a downward trend for three consecutive months. December scores, however, show a reversal—the rate of 12.36 for that month being the highest since August. The following contestants (41) report perfect scores for the month of December:

Division I—Paper and Pulp Mills

Group A (None)

Group B

West Virginia Pulp & Paper Co., Tyrone, Pa.

Howard Smith Paper Mills, Ltd., Beauharnois, Que., Canada.

Group C

Spaulding Fibre Co., Inc., North Rochester, N.H.

Price Bros. & Co., Ltd., Jonquiere, Que., Canada.

Certain-teed Products Corp., York, Pa.

Group D

Hollingsworth & Whitney Co., Waterville, Me.

Manistique Pulp & Paper Co., Manistique, Mich.

Container Corp. of America, Carthage, Ind.

Armstrong Cork Co., Pensacola, Fla.

Certain-teed Products Corp., Niagara Falls, N.Y.

Mead Corp., (Wheelwright Div.), North Leominster, Mass.

Certain-teed Products, Richmond, Calif.

Marathon Corp., Ashland, Wis.

National Gypsum Co., Kalamazoo, Mich.

Strathmore Paper Co., (Mill No. 1), Woronoco, Mass.

Container Corp. of America, (Calif. Container Div.), Los Angeles, Calif.

Fort Wayne Corrugated Paper Co., Vincennes, Ind.

American Writing Paper Corp., (Albion Div.), Holyoke, Mass.

National Gypsum Co., Newburgh, N.Y.

International Paper Co., Livermore Falls, Maine.

Riegel Paper Corp., Riegelsville, N.J.

American Writing Paper Corp., (Mt. Tom Div.), Holyoke, Mass.

Kimberly-Clark Corp. of Canada, Ltd., Kapuskasing, Ont., Canada.

Division II—Paper and Board Remanufacturing

Group A (None)

Group B

Canadian Cellucotton Products Co., Ltd., Niagara Falls, Ont., Canada.

Container Corp. of America, Cleveland, Ohio.

Container Corp. of America, Anderson, Ind.

Group C

Kimberly-Clark Corp., Appleton, Wis.

Gaylord Container Corp., Atlanta, Ga.

Marinette Paper Co., S. Glens Falls, N.Y.

Orchard Paper Co., St. Louis, Mo.

Certain-teed Products, Dallas, Tex.

Gaylord Container Corp., Tampa, Fla.

Thilmany Pulp & Paper Co., (Bag Mill), Kaukauna, Wis.

Research Products Corp., Madison, Wis.

Pillsbury Mills, Inc., Wellsburg, West Va.

Certain-teed Products, Kansas City, Mo.

Certain-teed Products, Buffalo, N.Y.

Flintkote Co., Hollywood, Calif.

ABC Corrugated Box Co., Minneapolis, Minn.

Bay West Paper Co., Green Bay, Wis.

Container Corp. of America, Atlanta, Ga.

New GOULDS Centrifugal Pumps

CLEAR LIQUIDS AT LOW COST

Fig. 3769

APPLICATIONS: Ideal for clear liquids, general water supply, circulating, transfer service, air conditioning, irrigation, and similar uses.

ADVANTAGES: Advanced design gives you compact simple construction with high operating efficiency, ease of installation and maintenance, and unusually low prices considering ratings and quality.

SIZES: Available in 14 sizes for both motor and belt drives. Capacities from 10 to 1800 GPM with heads to 120 ft. Available in standard fitted and all iron construction.

Write for Bulletin 622-A-2 today for complete details on this new centrifugal for clear liquids.

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The Right Pump For Your Job

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YOUR NAME_____

COMPANY_____

STREET_____

CITY_____ STATE_____

NAMES in the News

PERSONALS

B. D. ROGERS RETIRES FROM BIRD—CREIGHTON HILL IS NEW APPOINTEE

After 41 years of continuous service with Bird & Son, Inc., East Walpole, Massachusetts, Benjamin D. Rogers has resigned as personnel director. Mr. Rogers has a wide acquaintance in the industry, particularly within the Paper and Pulp Section of the National Safety Council. He had been an active participant in the work of that group for a number of years.

B. D. Rogers (L) and Creighton Hill

Appointed to succeed Mr. Rogers is Creighton Hill, who has been serving as director of industrial relations for Bird & Son. His new duties will include the administration of the company's various employee benefit programs such as its profit sharing retirement plan, group insurance program, and credit union. He will continue to handle the company's industrial relations matters.

▼

FINK HEADS WESTINGHOUSE INDUSTRY ENGINEERING DEPT.

Westinghouse Electric Corporation, Pittsburgh, has announced the appointment of J. C. Fink as manager of the industry engineering department. He was previously manager of the general mill section of this department in charge of the direction and supervision of engineers engaged in the application of electrical equipment to many industries, including the paper, machine tool, textile, rubber, and materials handling.

Mr. Fink received his B. S. in electrical engineering from Penn State in 1927 and joined the Westinghouse student course that same year.

▼

RIEGEL MAKES HARRISON MGR. OF PRODUCTION—ROBT. EVANS SECRETARY

Promotion of Ward Harrison to the position of manager of production and the election of Robert H. Evans as secretary of the company was recently announced by the Riegel Paper Corporation.

Mr. Harrison will be responsible to Walker Hamilton, executive vice president and general manager, for manufacturing operations at all Riegel plants—Milford, Warren Glen, Hughesville, and Riegelsville, New Jersey. He also will continue to be responsible for the company's timberlands near Acme, North Carolina.

From 1936 to 1941, Mr. Harrison was with Riegel in development work. From 1941 to 1948, he was with Ecusta Paper Corporation, Pisgah Forest, North Carolina, ultimately as assistant general manager. He returned to Riegel in 1948 as assistant to Mr. Hamilton. He is a member of TAPPI, the American Pulp and Paper Mill Superintendents Association, and the American Institute of Chemical Engineers.

In the office of secretary, Mr. Evans succeeds A. P. Mitchell, who will continue as vice president and general sales manager. For the past two years, Mr. Evans has been assistant secretary and assistant treasurer of Riegel Paper. He served with the War Production Board as assistant chief, and later as chief of the Pulp Allocation Board, from January, 1942, to October 1945. He was formerly with the Fiduciary Trust Company of New York. Mr. Evans is chairman of the export committee of the American Paper and Pulp Association.

Robt. H. Evans (L) and Ward Harrison

▼

TWO NEW EXECUTIVE APPOINTMENTS ARE MADE BY NORMA-HOFFMANN CO.

Recently Erwin J. Schmiel was appointed secretary-treasurer and Ralph O. Wirtemburg, sales manager, of the Norma-Hoffmann Bearings Corporation, Stamford, Connecticut.

Mr. Schmiel succeeds Edward C. Lennon, who is retiring after 35 years of service. Mr. Schmiel was most recently general auditor of the Elastic Stop Nut Corporation, and for 20 years prior to that was a member of the New York firm of Fedde & Company, certified public accountants.

E. J. Schmiel (L) and R. O. Wirtemburg

Mr. Wirtemburg succeeds Frederick W. Mesinger, who resigned from the company. Previously he was eastern regional sales manager of the New Departure Division of General Motors.

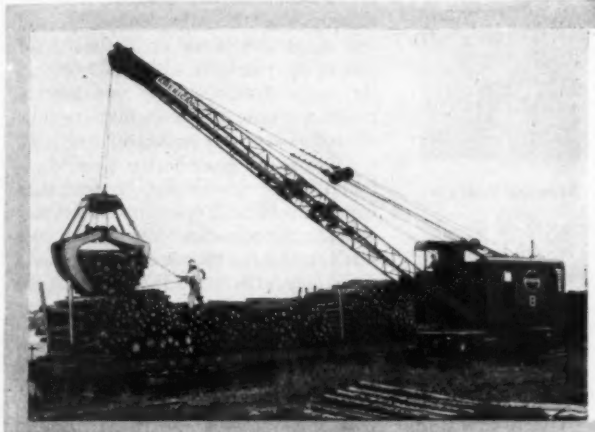
▼

H. R. BALDWIN RETIRES FROM HAMMERMILL—LONG ACTIVE IN THE INDUSTRY

After almost 35 years of service, Harrison R. Baldwin, vice president in charge of sales, retired December 31st from the Hammermill Paper Company, Erie, Pennsylvania.

Mr. Baldwin has been active in the paper industry for many years, serving as president of the Writing Paper Manufacturers Association from 1932 until 1935, as chairman of its Sulphite Bond Division, and in addition as chairman of the association's finance committee for several years. He has also been a member of the finance committee of

FIVE...SIX...
pick up sticks



SEVEN...EIGHT...
lay them straight

NINE...TEN...do it again!

The American Dieselectric is both a locomotive and a crane. But when you see it handling pulpwood, you will classify it also as a first class loader and stacker. Specially designed models like this one, built for Minnesota and Ontario Paper Company, cut the cost of "picking up sticks" to rock bottom. Notice the high, off-center cab, which lets the operator see the top of high pulpwood piles. Think of *diesel* power to the deck, *electric* power to the wheels . . . the great, basic invention that made the DIESELECTRIC. With 14,000 lbs. of wearing parts eliminated; with new, speedy "live boom" action; with a wonderfully clean, efficient machinery deck, the AMERICAN DIESELECTRIC offers such savings that it actually *pays for itself in five years!* Want more facts? Mail the coupon for illustrated catalog.

American Hoist
and DERRICK COMPANY
St. Paul 1, Minnesota
Plant No. 2: So. Kearny, N.J.
Sales Offices: NEW YORK • PITTSBURGH • CHICAGO

9612

AMERICAN HOIST & DERRICK CO., St. Paul 1, Minnesota
Please send me Catalog 600-L-4, on the
American Dieselectric Locomotive Crane

Name_____
Company_____
Address_____
City_____ State_____

42

the American Paper and Pulp Association continuously since 1933.

During World War II Mr. Baldwin was chairman of the advisory committee for the writing and other fine paper industries, and in the '30s was chairman of the Code Authority under NRA.

Originally a newspaper *man, Mr. Baldwin founded and served as the first editor of the employees' publication, *The Hammermill Bond,* and was successively assistant advertising manager, assistant sales manager, sales manager, and vice president in charge of sales.

▼

▶▶▶ Hewitt-Robins Incorporated, New York, has appointed *Bernard H. McGuiness* vice president of its Robins Conveyors Division. For the past three years Mr. McGuiness has been works manager of the Passaic, New Jersey, plant, and previous to that was for many years general superintendent of installations of the Robins Conveyors Division. He joined the company in 1923, and has been in charge of field crews which installed belt conveyors and other materials-handling machinery at industrial plants and mines throughout the world.

B. H. McGuiness

V. B. Baker

BAKER IS NEW MANAGER OF THE GENERAL MILL SECTION AT WESTINGHOUSE

The promotion of V. B. Baker to the position as manager of the General Mill Section of the Industry Engineering Department, has been announced by Westinghouse Electric Corporation, East Pittsburgh. Mr. Baker has been connected with the General Mill Section since he first became associated with the company in 1939. He succeeds J. C. Fink, recently made manager of the Industry Engineering Department.

During the time he has been connected with the General Mill Section, Mr. Baker has devoted the major portion of his time to application engineering work in connection with the pulp and paper industry. He is a registered professional engineer and a member of the A. I. E. E.

ROSLUND LEAVES PHILA. OFFICE OF ASTEN-HILL- TO REPR. CO. ON COAST

Leaving the direct employ of Asten-Hill Manufacturing Company, Philadelphia, after 10 years, John Roslund will become the Pacific Coast representative of both Asten-Hill and H. Waterbury & Sons Company, Oriskany, New York. His offices are located in the Pacific Building, Portland, Oregon.

John V. Roslund

Kenneth D. Hay

Kenneth D. Hay succeeds to the sales territory which was covered by Mr. Roslund. He was formerly with Peter J. Schweitzer, Inc., Spotswood, New Jersey, for seven years, following his graduation from Tufts.

Both men are members of the Technical Association of the Pulp and Paper Industry, and Mr. Roslund also is a member of the American Pulp and Paper Mill Superintendents Association.

Mr. Roslund is well acquainted in the paper industry, having worked in the Paper Mill Division of SKF Industries, New York City, for the Baker Manufacturing Company, Saratoga Springs, New York, as chief engineer in charge of the design of pulp and paper mill machinery, and later for Moore & White Company of Philadelphia as a sales and service engineer.

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▶▶▶ Foster D. Snell, Inc., New York City, has appointed *John J. Mahoney* as director of engineering. For the past several years he has been actively engaged in chemical engineering work as chemical project engineer for Colgate-Palmolive-Peet.

▼

LYMAN BEEMAN NEW PRES. FINCH, PRUYN AND CO.— MAURICE HOOPES RETIRES

The retirement of Maurice Hoopes, who has served as president of Finch, Pruyn and Company, Inc., Glens Falls, New York, for the past 40 years, was announced at the company's annual meeting on January 10. Lyman A. Beeman, until recently a vice president of the St. Regis Paper Company, was elected to succeed him. Mr. Beeman is a son-in-law of Mr. Hoopes.

MARATHON GIVES ANTHONY NEW POST AS REGIONAL MGR. EASTERN SALES

Regional manager of the Eastern Sales Region, Marathon Corporation, Menasha, Wisconsin, is the new appointment given to Paul Anthony by that company. Mr. Anthony succeeds R. A. Nash, who resigned January 15, to become vice president of sales of The Sorg Paper Company, Middletown, Ohio. He will be stationed in New York City.

With Marathon since 1924, Mr. Anthony has worked in several different departments of the company and on various special assignments. He did special project work on various food packaging products and was active in the original development and promotional work on products that are now classed as specialty packaging products.

During the war, he handled Marathon's contacts with the Quartermaster Corps in New York City and other government agencies. During the past few years he has been acting as specialty packaging salesman in the New York area.

Paul Anthony

W. S. Bromley

W. S. BROMLEY BECOMES FOREST ENGINEER FOR APA

An important announcement made by the American Pulpwood Association in January was the appointment of W. S. Bromley, Ironwood, Michigan, to the post of Forest Engineer in charge of the Association's Mechanization Program. He will also direct the Association's conservation program and other allied forest activities.

Mr. Bromley's background of training and experience in forestry and woods work covers most of the forest regions east of the Rockies. He is a graduate of Penn State (1931) and earned his M. F. at Yale University. He served as a ranger and C.C.C. Camp superintendent for three years in the Ohio Division of Forestry, having full charge of two logging jobs and the operation of two portable sawmills. He was then with the U. S. Forest Service for nearly five years, a major portion of his time being spent in the Division of Private Forestry. In 1939 he joined the faculty of the Forestry School of the

University of Michigan to do research for two years on the utilization of timber in northern Michigan. At the close of the war he opened his own consulting business at Ironwood, Michigan. In addition, he has operated a pulpwood organization of his own on more than 2,000 acres of land. On several occasions, his work has taken him to Canada where he has had an opportunity to study timber conditions and logging methods in that country.

Mr. Bromley is a director of the Michigan-Wisconsin Timber Producers Association, and an active member of a joint committee of the Timber Producers Association and the Northern Hemlock and Hardwood Manufacturers Association. During the war he was a member of the Technical Committee on Forest Products of the Michigan Planning Commission. He is a senior member of the Society of American Foresters, a member of the national Committee of Forest Practices, and was chairman of the local committee which drew up the recommended Forest Practices for the Wisconsin-Upper Michigan section of the Society.

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▶▶▶ On January 1 *Raymond F. DeVoe* became vice president of Robert Gair Company, Inc., New York.

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LINK-BELT CO. PROMOTES WHINREY AND HEINLEIN AT INDIANAPOLIS PLANT

From the general offices of the Link-Belt Company in Chicago, comes the announcement that R. E. Whinrey has been appointed to the newly-created position of assistant general manager of the company's Dodge plant in Indianapolis. Mr. Whinrey has been connected with the Dodge plant since 1925; he has been superintendent since 1940.

R. E. Whinrey

L. C. Heinlein

Former assistant to Mr. Whinrey has been appointed to succeed him. He is L. C. Heinlein, who has been employed at the Dodge plant since 1926.

Both Mr. Whinrey and Mr. Heinlein became associated with the Dodge plant after graduating from courses in mechanical engineering at Purdue University.

BOLLAERT HAS BEEN MADE VICE PRES.—IN CHARGE OF THE DICALITE DIV.

The new vice president in charge of the Dicalite Division of the Great Lakes Carbon Corporation is Armand R. Bollaert, formerly manager and technical director of this division of the company. His headquarters is in Los Angeles, near the division's plants and deposits of diatomaceous earth.

Mr. Bollaert was formerly head of research and development of the Celotex Corporation, director of research and development of the J. W. Mortell Company, and chief chemist of the Lehon Company.

▼

PERSONNEL CHANGES AT FAIRBANKS, MORSE CO. RESULT IN PROMOTIONS

A number of promotions and changes recently took place in the Sales Division of Fairbanks, Morse & Co., Chicago.

O. O. Lewis, formerly assistant sales manager, has been promoted to sales manager. Harry L. Hilleary, for the past 17 years manager of the firm's St. Louis branch, has been transferred to Chicago and promoted to the position of assistant sales manager.

L. A. Weom, manager of the Pump Division, has been transferred to St. Louis as branch house manager, succeeding Mr. Hilleary. Donald T. Johnstone, formerly assistant manager of the Pump Division, succeeds Mr. Weom as manager, with offices in Chicago.

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▶▶▶ Associated with the automotive equipment industry for nearly twenty years, *Maynard B. Terry* has been appointed vice president of the American Brakeblok Division of the American Brake Shoe Company, Detroit. Mr. Terry was formerly general sales manager and has served in various sales capacities since joining the Brake Shoe Company in 1943. He will continue to have his headquarters at Detroit.

▼

JOS. A. NEUBAUER MADE TECH. DIR. FOR COLUMBIA CHEM. & SOUTHERN ALKALI

The former technical adviser of the Columbia Chemical Division of Pittsburgh Plate Glass since 1945, Joseph A. Neubauer, has been appointed technical director for Columbia Chemical as well as Southern Alkali Corporation with headquarters in Pittsburgh, Pennsylvania.

Upon becoming associated with the company in 1933, Mr. Neubauer worked in the soda ash and chlorine departments in the firm's Barberton, Ohio, plant. He was the first superintendent of Columbia's large chlorine and caustic soda producing plant at Natrium, West Virginia, which went into production in 1943.

During 1948 Southern Alkali (jointly owned by Pittsburgh Plate Glass Company and American Cyanamid Corporation) put into production one of the nation's largest caustic soda and chlorine producing plants at Lake Charles, Louisiana. The company operates extensive chlorine, caustic soda, and soda ash facilities at Corpus Christi, Texas.

Jos. A. Neubauer

Dr. Robt. A. Baum

DR. BAUM WILL REPRESENT BULKLEY, DUNTON PULP CO. IN PACIFIC COAST AREA

Dr. Robert A. Baum has been appointed to handle sales of Sveen Pedersen Flotation Save-alls and other products of the Specialty Products Department of the Bulkley, Dunton Pulp Company, Inc., New York, to West Coast paper mills. His headquarters will be in Los Angeles.

Dr. Baum is a member of TAPPI and won the TAPPI Shibley Award in 1945. He is a charter member of Papermakers and Associates of Southern California, and chairman of the California Manufacturers Association Committee on Industrial Waste and Water Pollution.

For the past 13 years Dr. Baum has been with the Fernstrom Paper Mills, holding the position of Technical Director of the company for the last three years and just prior to his joining Bulkley, Dunton. He is a graduate of Pomona College and the University of California at Los Angeles, and holds the degree of Doctor of Science in Chemical Engineering.

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▶▶▶ Late in January announcement was made that *Donald F. Morris* had been promoted to vice president in charge of procurement at The Mead Corporation, Chillicothe, Ohio. He will handle direction and control of all corporation purchase activities, and also will continue in the management of Mead's white paper operations.

R. H. LAFTMAN FORCED TO GIVE UP ACTIVE WORK

The retirement of R. H. Laftman from the position of general manager of The National Container Corporation, Jacksonville, Florida, was announced last month by Samuel Kipnis, company president. Mr. Laftman is giving up the work he has carried on for the past decade, on account of ill health. He will, however, continue to serve as vice president and director, and consultant to the corporation.

W. T. Webster, who has been assistant manager will succeed Mr. Laftman as general manager at Jacksonville, and as director of the company's other mill operations.

Mr. Laftman has had a long and colorful career in paper mill work since he came to America from his native Sweden in 1911. He has been associated with such large companies as Southern Kraft Company, Moss Point, Mississippi; Chesapeake Corporation, West Point, Virginia; and other prominent paper mill organizations in the South. He played a prominent part in the building programs of some of the big plants in the southern states. Mr. Laftman is a member of the Technical Association of the Pulp and Paper Industry.

▼

LYSTER RETIRES AS CHIEF ENGINEEER AT HOOKER CO. E. K. NEWTON TAKES OVER

Chief engineer of the Hooker Electrochemical Company from 1914 to 1917 and from 1937 through 1948, T. L. B. Lyster, has retired. E. K. Newton, who has held various engineering positions with the company since 1919, succeeds him.

Mr. Lyster will continue his service to the company as consulting engineer. He has been associated with Hooker in various capacities since 1907 as construction engineer, director of development, consulting engineer, and chief engineer. He devoted much of his time to pulp and paper industry service and engineering from 1922 to 1932.

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▶▶▶ Appointment of *Earle R. Deahl* as district sales manager of the newly established Chicago division of The Upson Company, Lockport, New York, has recently been announced. The Chicago division, over which Mr. Deahl will have supervision, includes Wisconsin, northern Illinois, Indiana, and Michigan. Since 1943 Mr. Deahl has been a field sales representative of The Upson Company with headquarters in Milwaukee. This organization manufactures laminated wood fiber wall and ceiling panels.

FRANK GILCHRIST RETIRES

The retirement of Frank Gilchrist, who has been in charge of sales at Rex Paper Company, Kalamazoo, Michigan, for the past eleven years, has been announced. He had been associated with paper mills of the Kalamazoo River Valley for about forty years.

Mr. Gilchrist took his first paper mill job in 1908 when he went to work in the office of Western Board and Paper Company at the time the plant was started with Alfred E. Curtenius as president. Later, he went to the Kalamazoo Paper Company, where Fred Hodge was president, as bookkeeper. His next position was a clerical job with Bryant Paper Company. When Wm. M. Loveland became president of Watervliet Paper Company, Mr. Gilchrist went to work for that organization and later became secretary and sales manager. He returned to Bryant Paper Company where he spent nine years as a salesman, from which job he went to Rex.

Frank Gilchrist

J. H. W. Conklin

J. H. W. CONKLIN ELECTED AS NEW PRESIDENT OF THE MATERIALS HANDLING INST.

At the third annual meeting of the National Materials Handling Exposition held in Philadelphia, January 10 to 14, J. H. W. Conklin, sales manager of the Industrial Truck Division, Clark Equipment Company, Battle Creek, Michigan, was elected president of the Materials Handling Institute. He succeeds S. W. Gibb, sales manager of Yale & Towne Manufacturing Company.

Other Institute officers elected for 1949 are: first vice president, J. G. Bucuss, Acme Steel Company; second vice president, J. P. Lawrence, The American MonoRail Company; secretary-treasurer, R. Kennedy Hanson.

As a result of an amendment voted at this meeting, the following past presidents of the Institute automatically become members of the board of directors upon termination of tenure: L. F. Kline, The Mercury Manufacturing Company; S. K. Towson, The Elwell-Parker Electric Company; and S. W. Gibb, Yale & Towne Manufacturing Company.

MACNAIR, PACKAGE EXPERT, IS NOW WITH ACME STEEL

In the capacity of consultant on product development, C. S. Macnair has joined the Acme Steel Company, Chicago, where he will be occupied largely with the Consumer Products Division, which specializes in steel strapping, corrugated fasteners, etc.

Mr. Macnair, who has been operating his own package engineering business in Chicago since 1926, comes to Acme with a general background in all phases of materials handling, shipping and packaging. Through his former company he has solved packaging and shipping problems for some of the major manufacturing concerns of America, and is considered an authority in his field. During the war Mr. Macnair did special work for the Navy Subsistence Repacking Program, and later, when in charge of all packing and container work for the 8th Naval District, established a laboratory to analyze packages. He has continued to work on contracts for various government agencies since the war in addition to his firm's regular industrial accounts.

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▶▶▶ Assuming responsibilities formerly carried by the comptroller's office, *R. F. Kendall* has been appointed credit manager of The Reliance Electric & Engineering Company, Cleveland, Ohio, P. G. McAusland, comptroller and treasurer of the Reliance Company, announced. Relieved from active duty with the Army in 1946, Mr. Kendall has been with Reliance's credit department since early 1947.

▼

DARRIN MADE VICE PRES. OF GENERAL ELECTRIC CO.

Assigned to customer relations work in the New England territory, with headquarters in Boston, Ralph M. Darrin was recently elected a commercial vice president of the General Electric Company. Until this appointment, he had been manager of the Apparatus Department's Central Station Divisions at Schenectady.

Mr. Darrin has served in various divisions of the company since 1919 in Pittsfield, Massachusetts; Buffalo, Syracuse, and New York City, as well as in Schenectady.

▼

CHANGES AT DE LAVAL

The following changes have taken place at the De Laval Steam Turbine Company, Trenton, New Jersey: Henry W. Johnson, although retiring as vice president, will continue as director and a member of the executive committee; C. Richard Waller is now a vice presi-

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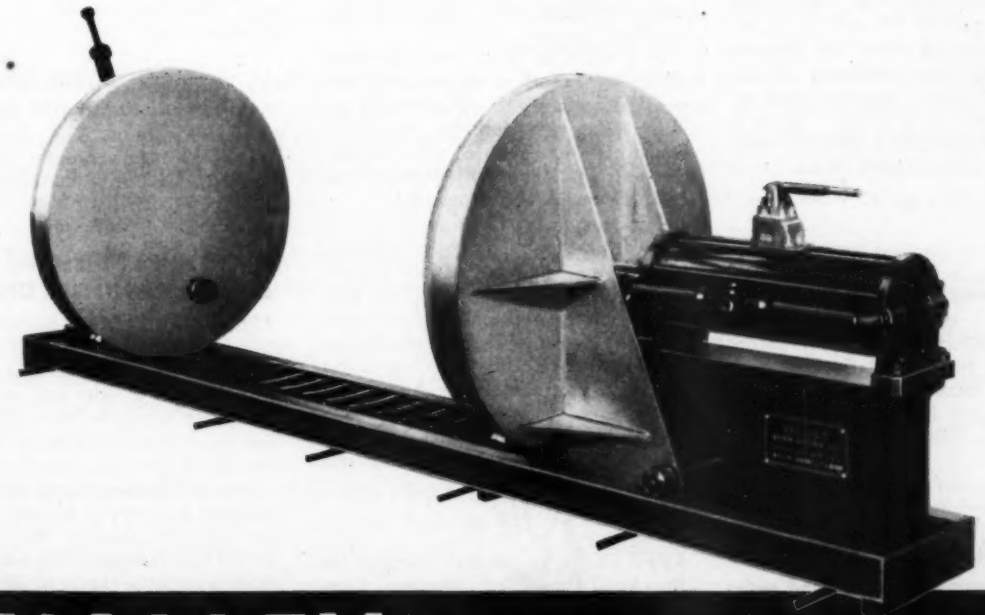

VALLEY IRON WORKS COMPANY
APPLETON, WISCONSIN

dent and director for engineering; H. G. Bauer is a new vice president and executive engineer; J. P. Stewart, manager of the Commercial Sales Division, has been elected a vice president; W. A. Reynolds, in addition to his position as manager of the IMO Pump and Worm Gear Divisions, assumes responsibility for the development and merchandising of new small products; W. A. Neumann, Jr., has been appointed controller.

▼

FRANK WHELAN WILL HEAD WELDING MACHINERY SALES DIVISION OF WORTHINGTON

With headquarters in Harrison, New Jersey, Frank J. Whelan, vice president, will head the welding machinery sales division of the Worthington Pump and Machinery Corporation.

He will supervise the sale of welding positioners and turning rolls manufactured at the corporation's Dunellen Works, in addition to supervising the sales of Worthington's standard pumps, compressors, and mechanical power transmission equipment sold through industrial and oil field distributors, as well as sales to original equipment manufacturers.

This change follows the company's intensified program for the distribution and sale of the welding machinery lines.

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▶▶▶ The Eastern Sales Division of Oliver United Filters, Inc., announced the appointment of *Thomas C. Reeves* to its engineering staff. Mr. Reeves was formerly chief engineer of the Sherwin-Williams Company plant at Bound Brook, New Jersey. He is a graduate of Syracuse University with the degrees of B. S. and Ch. E.

▼

▶▶▶ The new manager of Dow Chemical Company's New York sales office is *Leo B. Grant,* who was associated with Dow's Magnesium Division in Midland, Michigan, for 20 years before joining the executive staff of its New York office about a year ago. Mr. Grant succeeds Ralph E. Dorland who held that position from 1919 until his death last May.

▼

CARL W. STEVENS IS NOW WITH TRUNDLE ASSOCIATES

Well known in the pulp and paper industry, Carl W. Stevens, recently became assistant to the president of the newly formed Trundle Associates, Inc., New York, consulting service for the pulp and paper industry (Cf. P.I. and P.W., Jan., 1949). His work will consist of visiting pulp and paper mills throughout the country to acquaint them with the Trundle service.

For 21 years prior to 1937, Mr. Stevens was a member of the firm and a director of the Stevens & Thompson Paper Company, North Hoosick, New York. He then became affiliated with the St. Regis Paper Company of New York, and in 1941 went to the Ammunition Container Corporation, Harvey, Illinois (a subsidiary of the American Can Company) as head Purchasing Agent. Following the war, he operated his own paper brokerage business, the C. W. Stevens Paper Company in Chicago, which he left to become a member of the Trundle staff.

Carl W. Stevens

F. J. Hoar

JACOB J. JENSSEN RESIGNS SUCCEEDED BY F. J. HOAR

Founder and President Jacob D. Jenssen has resigned as president of the G. D. Jenssen Company, Inc., Watertown, New York, but will continue his association with the company as technical consultant and adviser to the board of directors.

F. J. Hoar of Watertown has been elected to the offices of president and treasurer, and F. S. MacDonald of Montreal as vice president. Mr. MacDonald is also associated with Homad Services, Ltd., and will continue his association with that company.

Mr. Jenssen has had a long association with the pulp and paper industry. He was the originator of the Jenssen Acid Tower System for sulphite mill production as well as founder of the Jenssen Company. He was an original member of the Technical Section of the Canadian Pulp and Paper Association at the time of its founding, and was also one of the early members of the Technical Association of the Pulp and Paper Industry.

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▶▶▶ The new general manager of Provincial Paper, Ltd., Montreal, Quebec, Canada, *A. P. Jewett,* has been with the company for 32 years. He is well known in the paper trade, and previous to his promotion was director of sales. During the war he served as administrator of fine papers in the Wartime Prices and Trade Board.

DURANT HAS BEEN ELECTED A VICE PRESIDENT OF P&IA

The election of L. G. Durant as vice president in charge of sales, engineering, and research has been anounced by Paper and Industrial Appliances, Inc., New York. Mr. Durant is now on a trip abroad visiting England, France, Belgium, Norway, and Sweden to complete manufacturing and sales arrangements for P. and I. products, including the Chemipulper and Brammer Recording Consistency Control unit.

Mr. Durant's experience, prior to 1945, covers many years in technical and mill operation activities of the pulp and paper industry, including association with Union Bag and Paper Company, E. B. Eddy Company Ltd., and J. R. Booth Ltd., of Ottawa, Ontario.

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SKF NAMES GOTWALS AS QUALITY MANAGER OF ALL ITS PLANTS

SKF Industries, Inc., Philadelphia, has announced the appointment of C. S. Gotwals as quality manager of all its plants. Mr. Gotwals (associated with the company since 1915) was responsible for the installation of SKF's rigid quality-control system during the war, and served as chief of inspection and quality control before becoming superintendent of the main plant in Philadelphia in 1944.

Charles R. Scott, Jr., who has been in charge of the machining division since 1946, succeeds Mr. Gotwals as superintendent.

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▶▶▶ Named vice president in charge of operations of Milprint, Inc., Milwaukee, Wisconsin, *C. K. Billeb,* general works manager since 1944, has been associated with the company for 12 years.

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NORTHERN EQUIPMENT CO. ANNOUNCES THREE CHANGES

Harold A. Schlieder has resigned as chief engineer of Northern Equipment Company, Erie, Pennsylvania, to open his own office as sales and service representative in upper New York State. His office will be located at 520 Robineau Road, Syracuse, New York.

Francis W. Bunting, who joined the company as a service engineer in 1935 and has been assistant chief engineer for the last two years, has been named chief engineer in charge of all sales and service engineering for the Northern Equipment Company.

Harry H. Weining, with the company since 1925, has been placed in charge of all production engineering in addition to his other duties as director of research.

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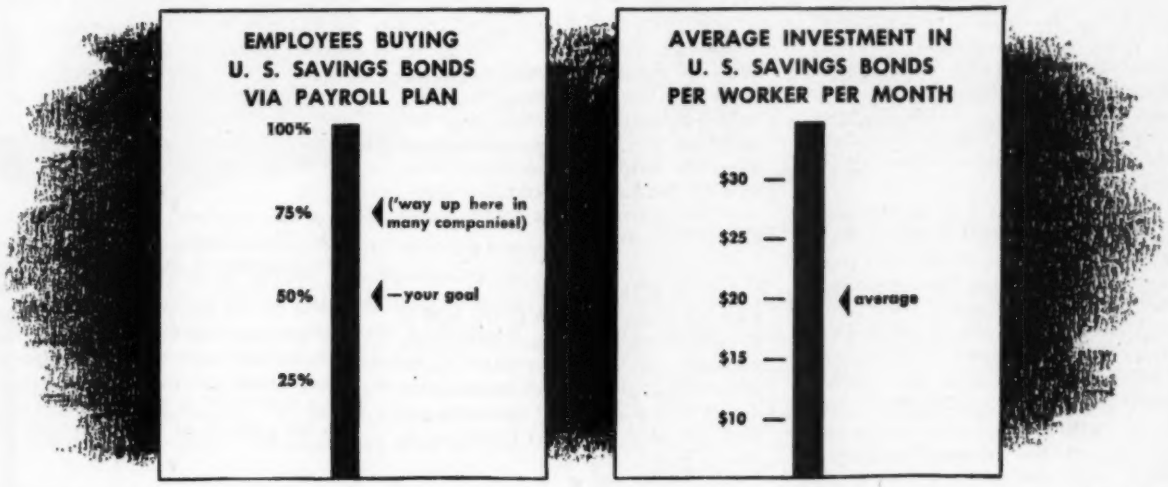

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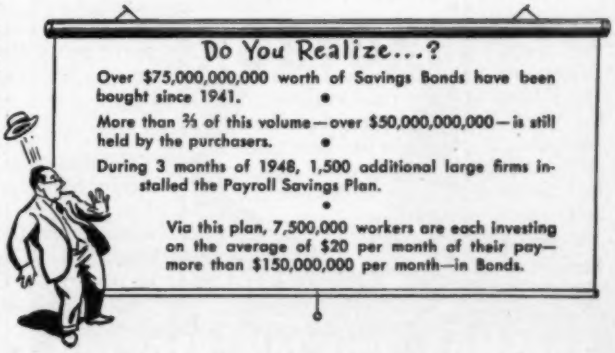
BENEFITS TO *EMPLOYERS:* The feeling of security that goes with participation in Payroll Savings makes workers more contented. Worrying less, they work better. Among the more than 20,000 large companies with Payroll Savings, records show that—following installation of the Plan—production increased, absenteeism and accidents decreased!

BENEFITS TO THE *NATION:* The Payroll Savings Plan is a powerful deterrent to inflationary forces. Every Savings Bond dollar built up in the Treasury withdraws a dollar from the swollen spending stream. The Plan thus contributes to national security—which affects *your* security!

WHAT CAN *YOU* DO? If your company has the Payroll Savings Plan, make sure it's being adequately promoted—backed by your top executives—to bring your company its full measure of benefits. If you haven't yet installed the Plan, why pass up its benefits any longer? All the help you need is available from your State Director, Savings Bonds Division, U. S. Treasury Department. He is listed in your telephone book. Call him now!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R. W. HADDOCK RETIRES FROM ESCANABA—SERVED IN THE INDUSTRY 60 YRS.

After 60 years of active service in the Canadian and American paper industry, R. W. Haddock, general superintendent of the Escanaba Paper Company, Escanaba, Michigan, for 29 years, has retired.

When a boy of 14, Mr. Haddock took his first job with the Dominion Paper Company, Kingsey Falls, Quebec, a mill still in operation. His second job was with a writing paper mill in Wilmer, Vermont, where he remained four years.

He later worked with the following companies: Kennebec Pulp & Paper Company, Augusta, Maine, two years; Great Northern Paper Company's newsprint mill, Millinocket, Maine, nine and one-half years; Minnesota and Ontario Paper Company, International Falls, Minnesota, nine and one-half years as paper mill superintendent.

In 1920, Mr. Haddock became associated with the Escanaba company to start up its new mill at Groos as general superintendent.

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▶▶▶ Associated with the Columbia Chemical Division of the Pittsburgh Plate Glass Company since 1943, *Brooks M. Dyer* was recently appointed St. Louis district sales manager with headquarters at 3650 Market Street, St. Louis, Missouri. Until his transfer to St. Louis last January, Mr. Dyer was assistant district sales manager at Philadelphia. Vernon L. Clark, former district sales manager, has been assigned to special sales duties.

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ROLAND PACKARD LEAVES SMITH PAPER CO. TO GO WITH BAGLEY & SEWALL

Roland A. Packard has joined the staff of the Bagley & Sewall Company, Watertown, New York, as a consultant. He was formerly chief engineer of the Smith Paper Company, Inc., Lee, Massachusetts, where he had been since 1928, and where, among other duties, he had charge of labor relations details and contract negotiations.

Frederick C. Holmes succeeds Mr. Packard as chief engineer at the Smith Paper Company. He has been associated with the company since 1942, and is a graduate of Worcester Polytechnic Institute with a B. S. degree in engineering.

As an engineer on the construction of a power dam for the Shawinigan Water & Power Company, Mr. Holmes went to Canada in 1931. A year later he went with the Gamwell Fire & Police Alarm Company in Newton Upper Falls, and from 1934 to 1938 was engineer and superintendent with the National Parks Service Camps. In 1938 he came to Lee, Massachusetts, as a town engineer, and the following year was retained as a consultant by Smith Paper Company, Inc.

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▶▶▶ At the annual meeting of directors of the Lee Paper Company, Vicksburg, Michigan, *Norman Bardeen* was elected a vice president in charge of sales. Mr. Bardeen is a brother of Maxwell D. Bardeen, Lee company president; his father was the former president of the company.

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▶▶▶ A recent addition to the staff of the Bjorksten Research Laboratories, Madison, Wisconsin, is *Mrs. Guitta Blau*, who graduated from Cornell University with a degree in chemistry and also studied at Columbia University in New York.

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DIAMOND ALKALI CO. HAS PROMOTED R. R. McCLURE

From Painesville, Ohio, comes word of the appointment of R. R. McClure to the position of general superintendent of the Pure Calcium Products Division plant of the Diamond Alkali Company.

Mr. McClure, connected with this division of the company for the past 19 years, became chief chemist in 1940, and was promoted to production manager in 1946, six months later becoming assistant division manager. Previous to his association with Diamond, Mr. McClure was for 10 years chief chemist for the Pennsylvania Rubber Company, Jeannette, Pennsylvania. He was engaged in important research and experimental work on calcium products with the Mellon Institute of Industrial Research from 1929 to 1932 with headquarters in the Diamond offices in Pittsburgh.

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▶▶▶ Promotion of *Lester J. Smith* from paper mill superintendent to that of plant manager in charge of mill operations at the Lyons Falls plant of the Gould Paper Company became effective January 13. Gould Paper Company is a division of Continental Can Company.

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▶▶▶ Recently mill manager of the Oxford Miami Paper Company at West Carrollton, Ohio, and formerly connected with the sales force of Paper Makers Chemical Division of Hercules Powder Company, *Thomas L. Stirling* has been appointed assistant to O. S. Barrie, manager of sales of Oxford Miami and western sales manager of the Oxford Paper Company.

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▶▶▶ Although *Robert M. Preston* of South Hadley, Massachusetts, is leaving the position he has held for a number of years as superintendent of the American Tissue Company's paper mills, he will remain with the company in an advisory capacity. *Victor C. Lemieux, Jr.*, of Holyoke, assistant superintendent, will become superintendent.

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▶▶▶ The former assistant eastern sales manager of St. Regis Multiwall Bag Division, *Logan G. Hill*, has moved up to the position of eastern sales manager. He has been associated with the sales promotion activities of this division of the company since 1930, both in New York and Chicago, and is a graduate of Yale University.

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▶▶▶ The former general sales manager of Clinton Industries, Inc., Clinton, Iowa, *Carl Whiteman*, was recently elected vice president of the company, at a board of directors meeting in the company's executive offices in St. Louis. Mr. Whiteman joined the company in February, 1948, to direct sales operations in the company's vigorous expansion and diversification program.

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CHANGES IN EXECUTIVE PERSONNEL ANNOUNCED BY WEST VIRGINIA P&P CO.

A number of changes in the management organization at its Charleston plant were recently announced by the West Virginia Pulp and Paper Company.

Theodore A. Cook, resident manager, said, "The company has for some time been interested in the possibility of extending its operations at Charleston to take better advantage of the wood supply and other opportunities afforded by location in this area. One possibility lies in the manufacture of dissolving pulp out of hardwoods with which we and others have been experimenting extensively, and for which we believe there is a growing market, although in some danger of over production. Given the co-operation of the community and the various public authorities concerned, we hope to be able to work out a project which will bring a good deal of new business to the plant and to Charleston. There remain, however, a number of serious technical and economic problems to

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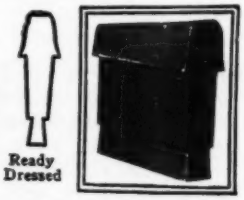

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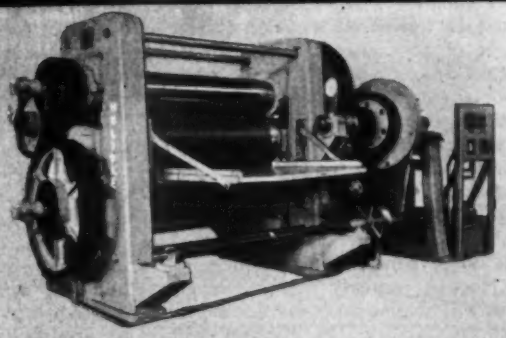

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explore before we can reach a firm decision.

"The changes announced this morning (January 18) are designed to release J. D. Cowan, assistant manager in charge of production, for special assignment in connection with the study of such problems."

As a result, L. F. Thompson, assistant manager in charge of administration, will for the time being become general assistant to Mr. Cook. C. A. Shoudy, formerly paper division superintendent, will assume a newly created position of general superintendent. J. A. Hoover, formerly machine supervisor, will become paper division superintendent, and E. M. Garrett will become machine supervisor. G. W. Swallow, formerly in the engineering design division, has been promoted to paper division engineer. The newly created position of chemical superintendent will be held by C. B. Rhoads. In addition to his past duties of having charge of recovery, lime burning, and liquor making, by-products at this plant will be under his supervision.

Additional duties have been given T. A. Willingham, pulp fiber division superintendent,—the wood yard and chipper divisions will be placed under his supervision. J. D. Wieters, formerly assistant supervisor of the by-products division, has been promoted to additional assistant to Mr. Willingham, assuming most of the duties formerly performed by J. T. Walker, who will be assigned to special duties in the manufacture of pulp. Arnold Werle will assume the position vacated by Mr. Wieters.

NECROLOGY

CHARLES G. WEBER

Charles G. Weber, assistant chief of the paper section, National Bureau of Standards, Washington, D. C., passed away suddenly, Tuesday, January 18, while he was delivering a lecture at the Bureau.

A member of the Bureau's staff for 20 years, he directed researches which gained him national recognition as an outstanding technologist in papermaking materials and processes, printing, packaging materials, low-cost housing materials, the standardization of testing methods for paper and related products, and the use of motion picture films for records.

Charles G. Weber

A number of articles authored by Mr. Weber have appeared from time to time in this magazine.

During World War II, he assisted the Army Map Service in the development of wet-strength map paper for field use which is far superior in durability to any previously used. He was successful in the development of improved methods in multicolor offset printing that greatly reduces losses caused by misregister of the prints. At the time of his death, he was directing research on the melamine-resin bonding of offset papers which has already yielded results which show that the proportion of hardwood fibers can be largely increased, thus conserving the scarcer supply of softwood fibers. He supervised research on low-cost housing materials in co-operation with the Federal Housing Administration.

Mr. Weber served on standardizing committees of the Technical Association of the Pulp and Paper Industry, the American Society for Testing Materials, and the Society of Motion Picture Engineers, and was a member of the Technical Committee of the Lithographic Technical Foundation. He was a veteran of World War I. He graduated from the New York State College of Forestry of Syracuse University in 1916.

He is survived by his widow and one daughter.

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F. W. VICKERY

On January 11, F. W. Vickery of Vickery's Ltd., London, passed away at his home in Guildford, Surrey, England.

Through the conception, development and construction of a number of important items of paper mill equipment, he contributed in many ways to the progress of the industry. Among the best known are the Vickery Felt Conditioner, the Vickery Doctor and the Dirtec all built in the United States by Bird Machine Company, South Walpole, Massachusetts.

During the first World War, Mr. Vickery did development work for the British Government and in recognition of the value of his services was decorated by his government with the Order of the British Empire.

Mr. Vickery had been responsible for the manufacture and sale of Bird machinery in England. The Vickery organization remains an active and important factor in the paper mill equipment industry in England and is expected to maintain the high traditions of service to the industry that Mr. Vickery initiated and fostered. Because of the importance and widespread use of the equipment developed by him, the name of Vickery will remain a prominent one in the paper industry throughout the world.

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HOWARD G. PHILBROOK

Connected with the Brown Company of Berlin, New Hampshire, since 1947, Howard G. Philbrook, engineering manager and consultant to the manufacturing department, passed away January 10.

A native of Shelburne, New Hampshire, Mr. Philbrook graduated from the University of Maine and was associated with engineering and industrial companies for several years before World War II, during which he served with the Springfield Ordnance District of the Army. Later he was with the Certain-teed Products Corporation as general manager of its Pan Tex Ordnance Plant at Amarillo, Texas, and more recently with the Celotex Corporation as vice president in charge of operations.

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▶▶▶ *August Frederick Tafel,* 78, retired paper mill superintendent, died suddenly January 17 in his home at Brownville, New York. Mr. Tafel was superintendent of the Wisconsin Pulp & Paper Company Mill in Stevens Point, Wisconsin, until his retirement in 1946. He served as superintendent of International Paper Company Mills at Three Rivers, Quebec, Gatineau Mills, Quebec, and Corner Brook, Newfoundland, and subsequently was employed by the Ontario Paper Company at Baie Coma, Quebec.

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▶▶▶ *Robert Seddon Hall,* an authority on pulp and paper mill management, passed away January 23 at Niagara Falls. He was 87 years of age. At one time he was superintendent of the Riordan Paper Mills at Thorold, Ontario.

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▶▶▶ One of the most experienced sales engineers of Oliver United Filters Inc., *Leo W. Knapp,* passed away December 18, as the result of injuries received in an automobile accident. He joined the eastern sales engineering staff of Oliver United Filters some twelve years ago, as a specialist in filtration problems in the coal, chemical, and general industrial fields.

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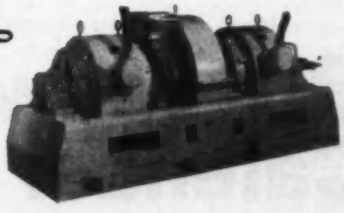

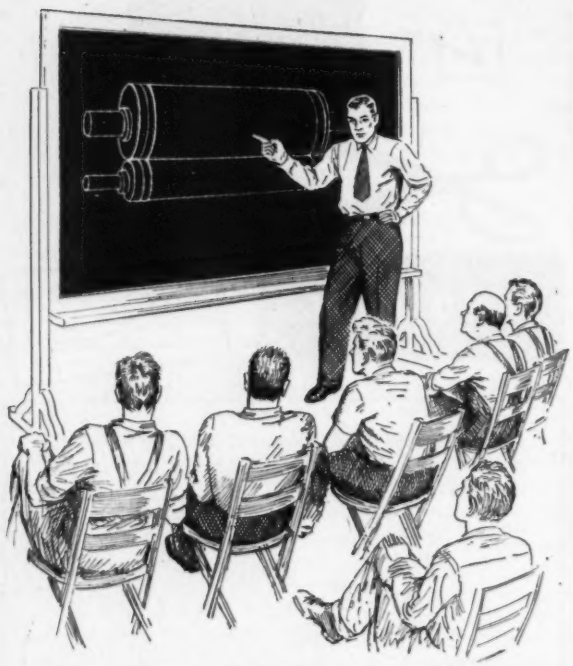

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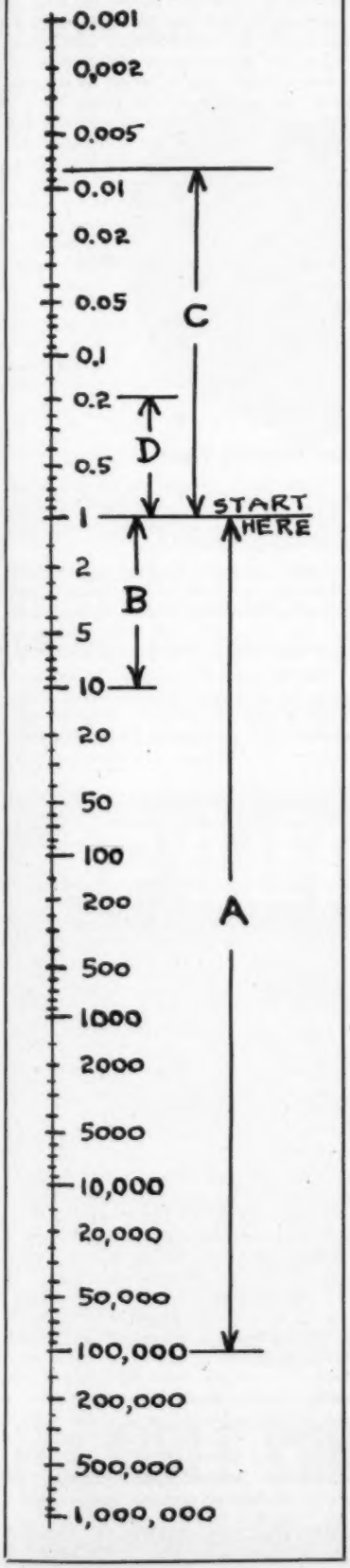


Practical SHORTS

Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

A Valuable Kink for Paper Plant Executives Concerning "Roots" and "Powers"

Paper plant executives and engineers are often "up against" the problem of extracting an odd root, or raising a number to an unusual power.

You can easily make your own device for quickly solving any such problem. Thus if you will take any slide rule and lay it end to end nine times and each time lay off the principal dividing lines you will have a chart exactly like the accompanying chart excepting that yours will be much longer and therefore it will be much more accurate. That is what this writer did in preparing this chart. Then it was reduced to this much smaller size. By following the above method you can make a chart that will go into the billions, trillions, or higher, as one limit; and a billionth, trillionth, or lower, as the other limit. There is no limit in fact. Then to keep track of the digits you simply read the numbers exactly as they stand on the chart. No juggling of digits is necessary. The writer does not know of any other method that is as simple as this. All other methods require "juggling of digits," as they say.

For example, what is the 5th root of 100,000? Measure the distance A from 1 to 100,000 as indicated on the chart. The distance B must then be exactly ⅕ of the distance A and there is your answer, namely, 10. In other words, divide the distance A by the root and the quotient shows you the distance to measure from 1 to find the answer. Always measure from "1" in either direction. "One" is always the starting point. To extract the square, cube, or other root of fractions is usually more complex than extracting roots of whole numbers. However, with this chart one is just as easy as the other.

For example, what is the cube root of .008? Measure the distance C from .008 to the starting point "1" and divide it by 3 and you get the distance D which tells us that the answer is 0.2.

A method that is as easy as any to find a third, fourth, fifth, etc. of any distance, is to use a pair of dividers. Adjust the dividers until you get the distance D exactly ⅓ of the distance C, and the chart gives the answer without any mathematical calculations whatever. With this chart you can determine the 3.127 power for instance—ANY power in fact. And you can extract the 4.37 root or any other root, all without mathematical jugglery. The "beauty" of it is: you have everything before your eyes in black and white.—W. F. SCHAPHORST, M. E.

Leveling Devices in Grouting . . .

In grouting, like anything else, elementary considerations often assume exaggerated controversial proportion. The advisability or necessity of removing jacks or wedges after grout has set usually stirs more than its share of pro and con opinion.

Heavy equipment needs to be placed on many square feet of grout, instead of being supported on a few points of contact with concentrated loading of 10 tons per quarter square inch, or at the rate of 40 tons per square inch.

Let's assume that a large rotating machine, requiring a grouting area of approximately 5 by 10 feet, is to be placed on a precast foundation of 6 by 12 feet. Also, the machine frame will weigh about 40 tons and is to be aligned, leveled and graded three inches above the precast concrete base. (Grade, as used in this instance, refers to elevation, with respect to a bench mark or relation to other equipment.) The frame is also provided with 10 bosses properly located to receive the 10 two-inch foundation bolts. In order to align, level and grade the frame, an adequate number of iron plates, approximately ½, ¾ and 1 inch thick, should be placed under the frame at six locations shown in the accompanying sketch. Grading and leveling with wedges and jack-bolts can be started when the nests of shims are properly spaced and located.

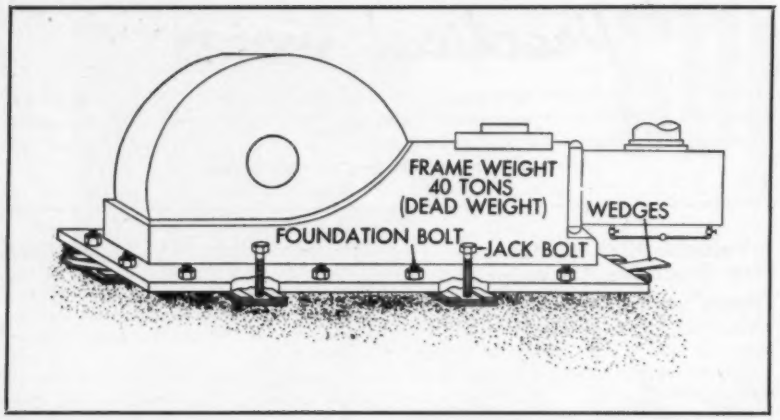
Tightening Stops Vibration

Assume further that the 40 tons is equally distributed on the six wedges or jack-bolts, each having about ¼ square inch bearing surface area. In spite of this condition, the grout is not yet ready to be placed in the three-inch space between the base of the engine and the roughened and wetted top of the foundation for several reasons.

The machine frame may shift out of level or grade from external vibration if it is not secured to the foundation by tightening the nuts on all foundation bolts as equally as possible, so that each is strained to a load of perhaps two tons. Rechecking the grade and level discloses that the equipment is a fraction out of level, but does not seem serious enough for releveling. Calculations reveal that the tightening of foundation bolts has, in effect, added approximately 20 more tons to the loading on the six ¼ square inch area contacts on the jack-bolts and wedges. Now, the concentrated load on each of the six points of contact is in the order of 10 tons per quarter square inch, or at the rate of approximately 40 tons to the square inch.

Wedges Weaken Foundation

Since all of the forms have been readied for grouting, the best preparation of grout is selected. In fact, labor and all other requirements are excellently met. The mixture contains about six gallons of water per sack



of cement and is adequately spaded and agitated to provide an excellent, sound, high compression strength grout. Assuming that a week has passed, the installation is still not ready for live load for the simple reason that the frame is still loaded on the knife edge and point contact of the wedges and jack-bolts. It should be understood that gravity grouting, as contrasted with pressure grouting, will not and cannot develop any upward pressure against the machine frame. An operation under these conditions is considered normal when it achieves only 75 per cent contact at zero pressure.

True, the equipment will operate satisfactorily if it is left on its present foundation. But, it will operate only until such a time as is required to peen or Brinell the six 10-ton contact points due to load vibration. The dent in the wedge or peen area could well reach a depth of .010 to .050 of an inch. This may be more than the elastic stretch of the foundation bolts. Under this condition, the entire frame is loose and free to move in accordance with the vibration of the unit. Yet, grouting continues to be done in this way.

For Best Results, Remove Wedges

This condition exists because wedges or jack-bolts were not withdrawn. Consider the case where the wedges had been removed or jack-bolts had been backed off. In such a case, the machine will not rest its 60 tons on six contact points, but will be uniformly distributed over the contact surface. If the grouting had set a week before wedges are removed and jack-bolts backed off, foundation bolts can be checked for tightness. With this check, the bed plate is held firmly against the grout area in contact with no chance to work free, as would be the case when the plate would be riding on the small area on the wedges or points of the jack-bolts. In the first case of riding on the wedges the rate is 40 tons to the square inch, while with the wedges removed the load is distributed to 16 or 17 pounds to the square inch. The latter is nominal loading and, in addition, adds weight of the foundation to the unit, all of which stabilizes the equipment. This hypothetical case, based on actual grouting data, indicates that the best results can be obtained only by removing wedges and jack-bolts.—By Leon A. Watts, ALLIS-CHALMERS MFG. CO. . . . Published in *Allis-Chalmers Electrical Review*, Fourth Quarter, 1948.

▼

To Seal Full Telescope Boxes

Gummed tape provides a strong, neat, pilfer-proof seal for telescope boxes. However, a full telescope box cannot be satisfactorily sealed with tape alone if it is overloaded so that the cover and body of the box cannot be held flush, fully overlapped. In such cases, the box should be bound by some other closure method though gummed tape can also be applied to make the box pilfer-proof.

With box upside down, apply strip of tape across middle of carton, Figure 1. Draw it down about half the depth on each side and anchor ends. This band will hold two parts of box in proper position for sealing open seams, Figure 2.

To seal open seams, use two strips of tape. Each strip should measure one width plus one length of the box plus a margin for overlap at each end. Apply half the width of the tape strip along sides of box first. Then fold tape in onto box bottom, pushing box down so that edge of cover is flush with box bottom, Figures 3, 4.

Turn box around and complete seal, Figure 5. The tape strips should overlap at center of short side, Figure 6.—From *Gummed Tape*, published by BETTER PACKAGES, INC.

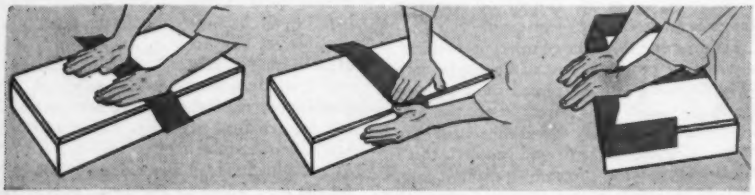


Figure 1 Figure 2 Figure 3

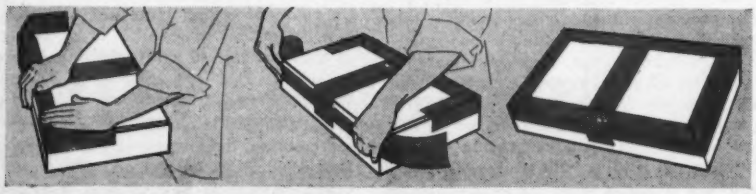


Figure 4 Figure 5 Figure 6

Arc Welding Flash

What causes irritation of the eyes when exposed to the arc of a welding or burning operation? Is such a condition serious? Can any permanent injury result?

These are questions that confront the safety engineer. Since human nature is such that some persons must learn the hard way, we are confronted with this problem in spite of all educational efforts to prevent it.

The spectrum or range of the waves of light extend from the short waves, ultraviolet at one end, to the infrared or long waves at the other end. It is the short wave potrion or ultraviolet that emanates from the electric arc.

Exposure to sunlight causes varying degrees of change of the skin from a reddening to a severe burn. The same type of ultraviolet rays of the arc will cause changes of the cornea of the eye. This may be mild if the exposure is short and the distance is great, but it will be increased with length of exposure and proximity of the arc.

The result of this exposure will be a burn of the cornea. Such a burn exposes the nerve endings and causes extreme pain.

The length of time for recovery depends on the degree of the burn. Treatment is to anesthetize the raw surface. A drop of pontocaine (½ per cent) at intervals will give relief. A soothing ointment (holocain or butyn) is used to reduce the exposure of nerve endings.

While the pain is very severe and disability marked in severe cases, there is seldom any serious effect. Extreme exposure with infection of the burned surface might result in ulceration. This is seldom, if ever, seen in controlled cases.

If the infrared rays—those from the opposite end of the spectrum—are the ones encountered, as in the glass blowing trade and certain other occupations, the effect goes beyond the cornea. Here the center of the retina may be damaged, and loss of function of that part with loss of vision may result. Such conditions do not result from electric flash burns.—*Dr. James D. Stark*, Chairman, Health Committee, PULP AND PAPER SECTION, NATIONAL SAFETY COUNCIL. Published in the January, 1949, issue of *The News Letter*, published by the Council for the P. and P. Section.

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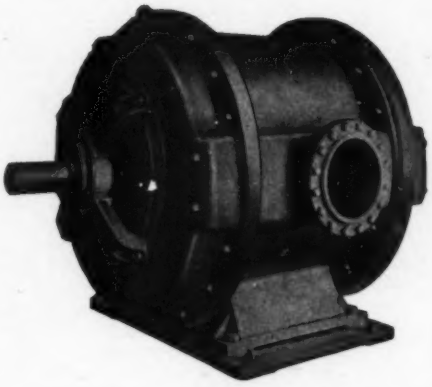

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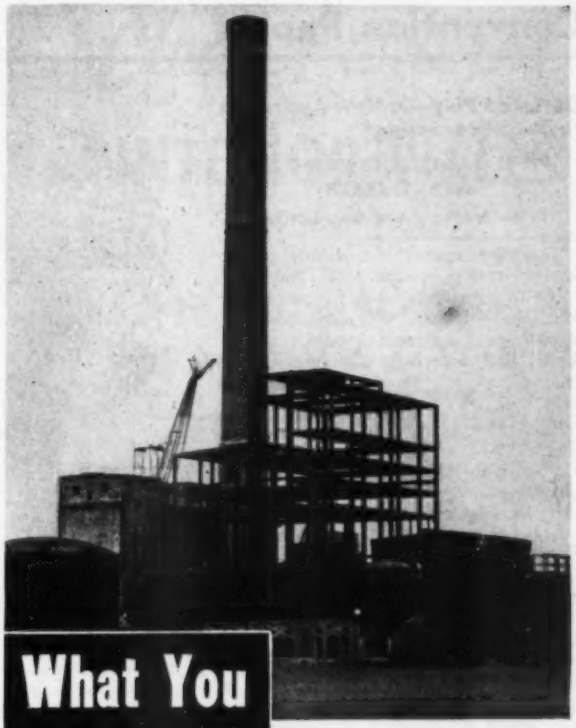

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Curlated Pulp—a New Approach to Pulp Processing*

H. S. HILL, J. EDWARDS
and L. R. BEATH
Price Brothers and Co., Limited

This paper describes a mechanical process for imparting permanent bends, kinks, and twists to pulp fibers; it lists some of the many changes which the process can bring about in pulp and paper properties, and indicates general fields of usefulness for the process and for the product, "Curlated Pulp."

The process, in essence, is extremely simple. Nodules of high consistency pulp are caused to roll in continuously changing directions between two surfaces which compress the nodules while they roll. All the essential requirements of the process may be accomplished on small scale by rolling a nodule of pulp with a circular action between the thumb and finger and continuing the action for a small part of a minute. Similarly, on a somewhat larger scale, the process may be carried out by squeezing a handful of slush pulp to a consistency of

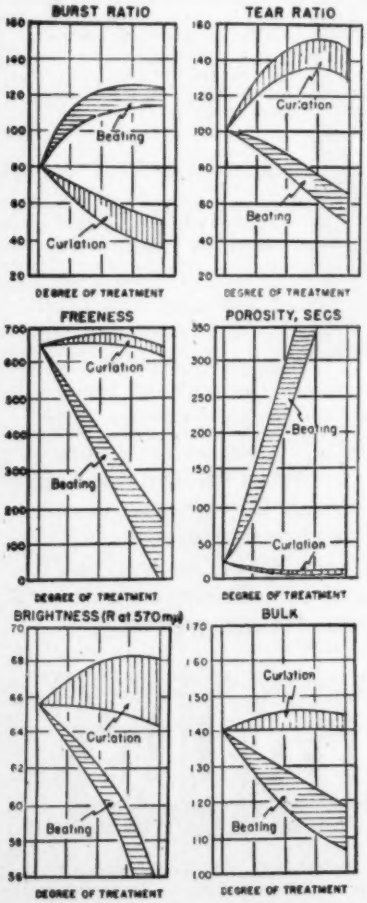

Fig. 2—Comparative trends on beating and curlation applied to slush sulphite pulp

Fig. 1—Conventionalized pulp nodule

15 to 25% placing the lump of de-watered pulp on a suitable tractive type of surface such as a piece of coarse canvas spread on a table, then breaking down the lump into crumbs or nodules under pressure by the flat of the hand using a gyratory type of motion and continuing the same action on the nodules for a minute or so with regrouping under the hand as necessary. Under this treatment, the nodules roll in changing direction while under compression, in the same manner as the single nodule behaves between the thumb and finger. A block having a suitable tractive surface may be substituted for the hand, and, of course, various mechanical means may be arranged to perform the required manipulation.

One of the fundamental requirements of the process is that the nodules traverse the contacting surfaces in rollwise fashion, that is to say, without slipping or smearing on the surface and without developing slip planes within the pulp itself. Another requirement is that the nodules are caused to roll in changing directions, although this change in direction may take place either continuously, as caused by gyratory motion of the working surfaces, or intermittently as accomplished by short, repeated, straight line action of the surfaces with regrouping and reorientation of the nodules between successive movements.

A still further requirement is that the nodules be compressed while they roll. These requirements impose certain definite limitations on conditions which may be employed in carrying out the process. The surfaces must possess the kind of roughness to provide good traction for the rolling nodules but without entanglement of fibres or otherwise impeding the rollwise traverse of the pulp over the surfaces. The relative movement of the surfaces must be slow, usually below 250 fpm. If a certain critical speed is exceeded, traction is lost and the pulp smears and builds up on the surfaces. Similarly, too heavy a compression will cause excessive flattening of the nodules and consequent breakdown of the necessary rollwise traverse.

Operating pressures are usually under 15 lb./sq. in. of the surfaces contacting the pulp. Speed and pressure are interdependent in this regard, the lower the speed the higher the permissible pressure, and vice versa. The breakdown point between rolling and smearing is abrupt. It varies widely between different classes of pulp and between individual pulps of the same class. It is quite strongly affected by temperature, pH, and by certain additive ingredients. It has been found convenient to rate this property by what has been termed the "curlation number," which is the operating pressure in pounds per square inch at which a standard sample of pulp breaks down from rolling to smearing when gyrated between standard surfaces at a standard speed. The word standard here is used in the sense of a fixed condition arbitrarily chosen as suitable for the purpose. It is beyond the scope of this paper to go into the many relationships as brought out by this test, but it may be noted in passing that the new approach appears to open up an interesting field of study on certain characteristics of fiber surface and on how these correlate with factors of pulping, on the one hand, and with properties of finished paper, on the other.

Within the curlation limit, variation in degree of treatment can be obtained by con-

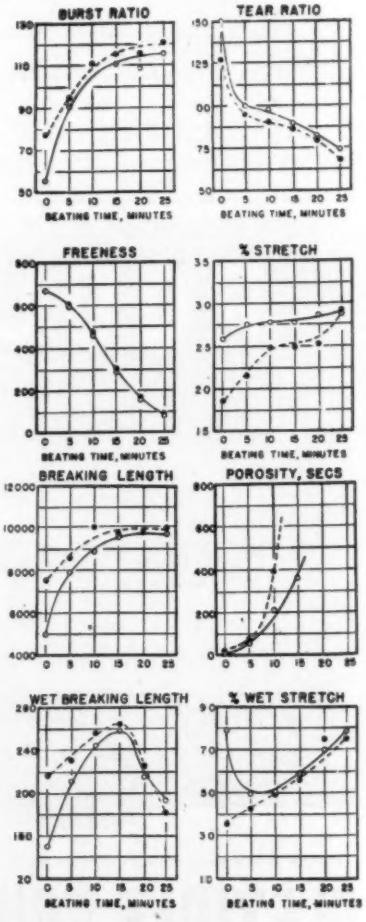

Fig. 4—Comparison of the effects of beating on curlated and on untreated slush sulphite pulp

°—curlated
•—untreated

(*) Abridgment of paper presented at the annual meeting of the Technical Section of the Canadian Pulp and Paper Association, Montreal, Que., January 26-28, 1949.

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trol of the operating pressure on the pulp, the speed of movement of the contacting surfaces, and the duration of the action, in short, by the input of power. The power requirements of the process are unusually low. About one horse power per daily ton is sufficient for some applications, and the general range is from one half to several horsepower per daily ton. Consistency of the pulp has some effect on the result although, obviously, the local consistency of the nodules under direct action will depend more on the operating pressure than on any lower starting consistency. The usual range of consistency in carrying out the process is 15 to 25%. In preparing the high-consistency nodulated stock for the process, best efficiency is obtained by providing some agitation of the pulp during intermediate de-watering stages. This induces extreme flocculation and sets up the necessary cleavage zones to give easy formation of nodules in the de-watered pulp.

Figure 1 shows a conventionalized sketch of a single pulp nodule with its fibers intertwined in essentially random orientation. It will be apparent that when such a lattice structure is compressed, the individual fibers are subjected to numerous short-radius bends over and about one another; then, as the nodule is forced to roll under compression, these bending actions become very numerous and occur in continually changing directions, the more so if the direction of rolling is also changing. It thus requires only a short time, or put another way, a short path of rolling traverse, before all the fibers have received intense short-radius flexing in many directions, and probably considerable twisting as well. Moreover, since cellulose and lignocellulose fibers are somewhat plastic, particularly when wet, the bends, kinks, and twists imparted by the flexing action take on a more or less permanent set, depending on the severity of the treatment. A close analogy is, that when a moist sheet of paper or linen is well crumpled it will set in a strongly wrinkled condition which persists after drying, and a point to observe is that the change in configuration may be obtained without rupture or other physical breakdown of the sheet structure. So it is with pulp fibers.

There is another important effect of the curlation method. The intense flexing action within the rolling nodule causes any fiber bundles to separate into single fibers, and thus the treated pulps are remarkably free of shives. In the same way the method is very efficient in defibering screenings and high-yield pulps. Again, a simple analogy may serve in explaining the effect. Consider several pieces of flexible cord glued together on their long axis. It will be found that the easiest way to separate the cords, and the one least likely to damage them, is vigorous, short radius flexing of the bonded unit throughout its length. So it is with bonded fibers.

There is no single, easily defined curlation effect; there are many degrees and modifications of the treatment, all of which may show up in different characteristic

	Untreated	Medium Curlation about 1 hp/da. ton	Heavy Curlation about 3 hp/da. ton
Burst ratio	67	50	37
Tear ratio	140	164	198
Breaking length	7200	4800	3610
Percent stretch	1.8	2.4	2.7
Bulk, cc. per m	1.376	1.373	1.400
Stiffness, (Gurley) mg	111	88	70
Porosity, sec	19	12	9
Freeness	689	698	670
Drainage time, sec	4.0	3.8	4.4
Wet burst ratio	0.790	0.760	0.675
Wet breaking length	205	146	110
Wet stretch, %	3.8	8.0	11.0
% b.d. after std. wet press	24.0	25.2	26.6

TABLE 1—Typical Curlation Effects on Slush, Unbleached Sulphite

TABLE 2—Relationships Between Curlation and Drying Unbleached Newsprint Sulphite

	1 Slush	2 Dried	3 Curlated	4 Curlated & Dried	5 Slush	6 Dried	7 Dried & Curlated
Burst ratio	77	38.2	55	28.3	87	66	57
Tear ratio	127	140	150	156	116	144	176
Breaking length	7480	4000	4940	2860	8100	6120	4610
% stretch	1.86	1.68	2.61	1.68	1.65	1.17	1.70
Bulk, cc. per g	1.372	1.569	1.374	1.601	1.399	1.496	1.438
Porosity (Gurley) sec	21	9	12	5			
Freeness, Can. Std	666	669	661	681	672	603	652
Drainage time, sec	3.9	4.5	3.9	4.0	—	—	—
Wet burst ratio	0.828	0.796	0.795	0.728	—	—	—
Wet breaking length	217	192	149	141	—	—	—
Wet % stretch	3.5	4.2	7.9	6.8	—	—	—
% b.d. after std. pressing	22.4	28.4	23.4	30.2	—	—	—

ways when applied to the widely divergent types of pulp used in modern papermaking. There are the complex relationships of the curlation effect with those of other pulp processing steps such as beating, bleaching, and drying. Finally there is the limitation of present space and time in relation to the great volume of experimental data which has already accumulated. Under these circumstances the purposes of this paper will be best served by an attempt to show the highlights of the subject and to present a few selected examples which appear to typify the curlation effect in some of the directions thus far explored.

As a first example of the process effect, Table 1 shows the change in pulp properties resulting from two increasing degrees of curlation, applied to slush, unbleached sulphite of newsprint grade.

The treatment is by hand, using a canvas covered block for rolling the pulp on a similar table surface. The indicated power input is estimated from correlation data with power driven equipment developed later. The treated pulp nodules are re-slushed directly after curlation by 100 turns in the Standard British sheet machine disintegrator. Pulp tests here, and elsewhere in the present paper, are by the Canadian Standard method.

It will be noted that freeness tends to increase on curlation. A drop in burst and tensile is balanced by a sharp rise in tear. Stretch, both wet and dry, shows marked increase as does porosity (inverse of time reading shown). Stiffness tends to drop, and bulk, after an initial drop due to the elimination of shives, tends to rise.

Figure 2 is an attempt to illustrate the distinctive nature of the curlation effect by presenting the trend relationships between curlation and conventional pulp refining as typified by beating, again with reference to slush, unbleached sulphite. The broad bands are merely indicative of the range of values which may be obtained under normal variation of the two kinds of treatment, and are not intended to define the limits of either. The curves represent the progressive change in the designated properties with increasing degrees of the two treatments, there being no direct basis, such as time or power of treatment, for comparison on a common scale.

It is apparent from the curves that the effects of curlation and beating present widely different characters; in fact, it is remarkable to what an extent the two effects are directly opposed. Both treatments, however, have shive reduction in common, although with curlation shives are eliminated very rapidly with low power consumption and without drop in freeness, whereas with beating shive reduction takes place gradually with high use of power and large drop in freeness. Small, bird-seed type of shives often persist throughout beating, but they cannot escape being defibered during curlation.

There is another prominent curlation effect which does not show in the foregoing classification, and that is the change in sheet appearance. Apart from the improvement in cleanliness from elimination of shives and soft dirt, sheets of curlated pulp take on a matte look, or put another way, the surface appears more optically level. There is a decrease in gloss and a corresponding increase in apparent brightness except for the view directly opposite incident illumination. This optical levelness of the surface seems still more pronounced in the case of colored sheets, and curlation appears to give a deeper shade of color with the same amount of dye. There is a slight tendency for opacity to increase with curlation. In regard to optical properties, therefore, the effect of curlation bears a general resemblance to that produced by a mineral loading material such as china clay, and again, shows opposite trends from those of beaten pulp.

Still another typical change brought about by curlation is that the wet pulp will dewater somewhat further under a given pressure, and will also lose water vapor more easily on drying. In terms of paper mill operation these changes indicate a somewhat drier sheet at the couch or wet press, and a lower steam pressure and less steam used for drying, presenting possibilities for economy and increased machine production.

The question of why curlated pulp exhibits these particular changes of quality opens up an interesting field of speculation. It would seem fairly obvious that an increase of bends, kinks and twists in the fibers will result in less area of bonded contacts throughout the sheet structure, and that this would in turn account for lower burst and tensile and higher tear. Sharply higher stretch values could be attributed to cumulative coil effect from the greater degree of fiber contortion. The increase in porosity would seem to be only partly explained by the decreased area of bonded contacts, and this brings up another peculiarity. It has been found that curlation produces a change in cross section shape of the fiber as well as that on the long axis. The usual somewhat ribbon-like flatness is changed towards a more tubular section. This reduces the projected width of the fibers, and in fact curlated fibers do look finer. As a consequence, a lattice structure of such fibers in a sheet of paper of a given weight has more space between fibers transversely to allow freer passage of fluids, such as air in the porosity test, oil in the absorbency test, water in drainage and wet pressing, and steam in drying.

Change in fiber shape could also account for the change in optical properties. The greater degree of fiber contortion causes more scattering of reflected light so that there is less visual definition of separate fibers. The result is the typical matte appearance of curlated pulp and its greater brightness in most views. Some of the optical levelness may also result from the fact that with curlated pulp there seems to be a marked absence of fibers exposed in full unbroken view at the plane of the surface, as compared with whole fibers which are readily visible in the case of untreated pulp, particularly after the fibers may have become glazed by heavy calendering.

Some of the relationships between curlation and drying of pulp are set forth in Table II, the pulp being unbleached newsprint sulphite, and the curlation treatment rather light.

Points both of similarity and of difference show up for curlation and drying. Strength properties and porosity exhibit quite similar trends for the two treatments, but stretch shows an opposing trend. Drying gives more bulking effect than curlation. In appearance, drying gives little of the typical matte effect produced by curlation and, of course, drying accomplishes no de-shiving or cleaning. When both curlation and drying are applied, the typical effects of each treatment appear to be additive, but in more pronounced degree when curlation precedes drying.

The question of the effect of beating on curlated pulp is a very complex one, for there are many kinds of beating and curlation, and many kinds of pulp. A specific example may serve to indicate the kind of result that is obtained. Figure 4 shows comparative beating effects on curlated and untreated samples of a slush newsprint sul-

phite. The curlation treatment is rather light, and the beating is done in standard manner in a Valley laboratory beater.

The curves show that the more divergent of the initial properties of the curlated pulp tend to approach those of the untreated pulp during the course of beating. Certain other characteristic curlation properties, however, persist strongly throughout beating, as witness, dry stretch and porosity. On the whole, it would appear that much of the curlation effect is retained, although in some respects it is masked by the very positive beating effect. Rate of freeness drop, however, appears little affected by the curlation pre-treatment. With heavier curlation, the effect is more persistent throughout beating than shown in the present example.

In the different case of applying curlation after beating, very pronounced effects are obtained at all degrees of beating. Figure 5 shows the pulp quality comparisons on samples taken after increasing time of beating, part of each sample being tested, as-is, and another part after curlation. Again the pulp is unbleached newsprint sulphite.

The curves show that curlation of beaten pulps produces the same trend of property changes that is given at the unbeaten stage, but that in some respects the effect is accentuated. Noteworthy is the change in the drainage properties from curlation of the more heavily beaten samples. It is indeed surprising to find the sharply increased rate of drainage resulting from a simple, mechanical manipulation of the pulp.

Figure 6 illustrates a similar series run on an entirely different class of pulp, a high-grade, bleached sulphate, previously dried.

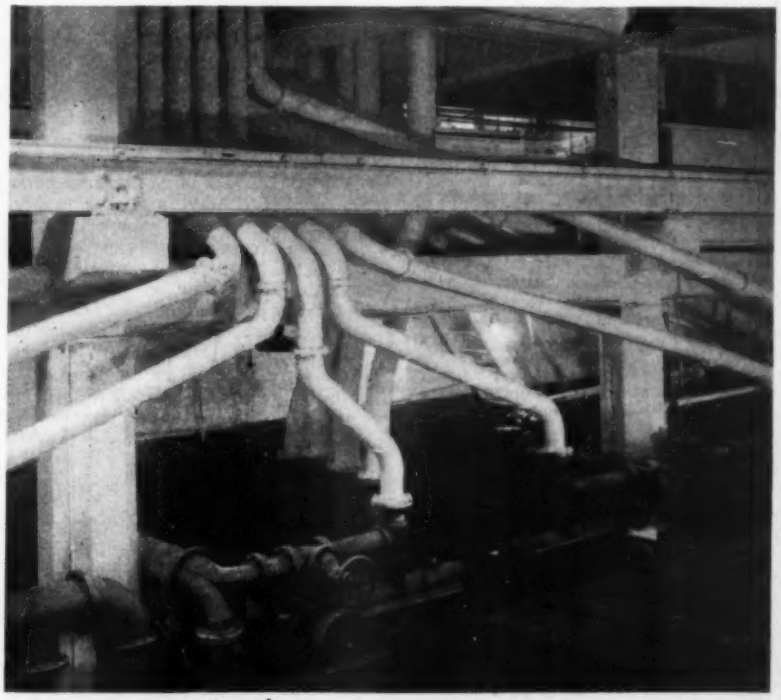
The results on the unbeaten sample are of interest since apparently the extreme properties of the untreated sulphate pulp influence the extent of the curlation effect. Thus, tearing strength is already near its possible maximum and therefore curlation cannot cause the sharp increase which in many cases is typical of the process. Similarly, bonding of the fibers is already so low that curlation cannot cause its usual decrease of burst and tensile strength. The increase in stretch, however, shows that the effect of curlation on fiber configuration is still present, and this may be verified under the microscope. As beating of this pulp progresses, curlation again asserts its typical effects on all properties, including a sharp increase in the rate of drainage imparted to heavily beaten pulp.

Soda pulp furnishes another example of extreme initial properties influencing the results obtained by curlation. Here the very low initial burst tends to increase, and bulk to decrease slightly. Stretch and tear, however, show typical curlation increase, and the usual improvement in optical levelness is also in evidence.

As might be expected, groundwood is more resistant to influence by curlation than are the chemical pulps. The application of ½ hp/da. ton, as in most of the foregoing examples, produces a little apparent effect on groundwood. If the power is stepped up to, say, 5-10 hp/da. ton, however. groundwood shows a readily perceptible change. Table 3, columns 1 and 2, gives the result obtained by curlation of newsprint groundwood, using about 8 hp/da. ton applied on laboratory scale by a power-driven gyrating plate.

The simple hand demonstration of the process which serves for chemical pulps does not lend itself to such applications requiring considerably higher input of power. Futhermore, with the more resistant materials, the effect of added power obtained by prolonged hand treatment is not the equivalent of that obtained by a higher intensity of treatment. The table shows the typical curlation effect on all properties except tear and freeness, both of which are somewhat reduced. It seems strange to find increased porosity with decreased freeness. The curlated groundwood has the expected more even texture and appearance, and the change in this direction appears greater than that which might be obtained by the same extra power added at the grinder. In another test, using a coarser, weaker groundwood, curlation with 5 hp/da. ton, gave a 50 per cent increase in burst, a slight rise in tear, and again a more even texture.

Table 3 also shows the effect of the curlation technique applied to groundwood screenings, using a power input of about 40 hp/da. ton, which for curlation must be considered very extreme. There is, in fact, little present indication how the process might be applied in this high power range commercially, but the experimental results are included here as a matter of some fun-



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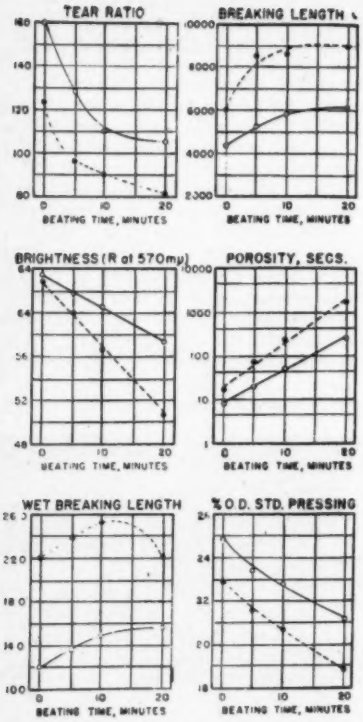

Fig. 5a—Effects of curlation on slush sulphite pulp after various degrees of beating

○—beaten (curlated)
●—beaten only

damental interest. As far as is known, this is the first demonstration of a very superior groundwood pulp obtained from groundwood screenings. Considered at equal freeness it is perhaps the highest quality of groundwood yet obtained by any means. The exceptional test values may be judged by comparison with those of the newsprint groundwood of column 2. In texture and appearance also, the special sheet compared favorably with regular newsprint groundwood.

Screenings from the usual types of chemical pulps are well defibered by curlation with moderate application of power, and with high freeness maintained in the resulting pulps. Broke and waste paper also yield

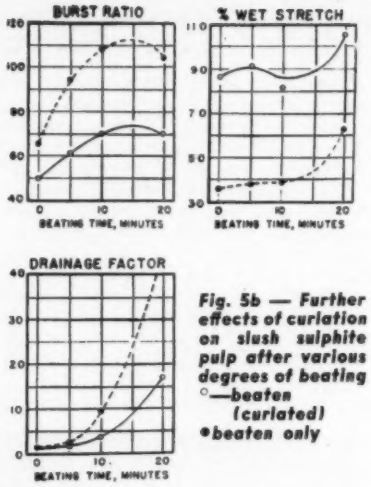

Fig. 5b — Further effects of curlation on slush sulphite pulp after various degrees of beating
○—beaten (curlated)
●beaten only

readily to the action, and clear pulps are obtained from even the most resistant papers, without the use of chemicals or boiling out treatments.

During the course of the development the natural question arose as to what happens to the properties of a pulp when it receives an extreme degree of curlation. Clearly, pulp fibers cannot withstand the intense flexing action of the process indefinitely without some form of breakdown. Table 3 includes a comparison showing the effect on an unbleached sulphite of an extreme curlation treatment, applying about 50 hp/da. ton by a power driven, gyrating plate. Again, the results are presented for their fundamental rather than immediate practical interest. The treated pulp, column 6, exhibits some noteworthy new trends. The great drop in freeness shows that the fibers have finally undergone rather drastic disintegration. Yet at the low freeness, tear has gone up to a high value, and burst and stiffness have fallen. Sheet porosity is still very high for such a large drop in freeness. Perhaps most remarkable of all, printing opacity has risen and brightness is unimpaired. The change in appearance is equally striking. The rather sleazy look of the initial unbleached sulphite sheet has changed to the level, somewhat chalky appearance of heavily loaded book paper. Altogether the treated pulp presents a unique combination of properties, one which seems to

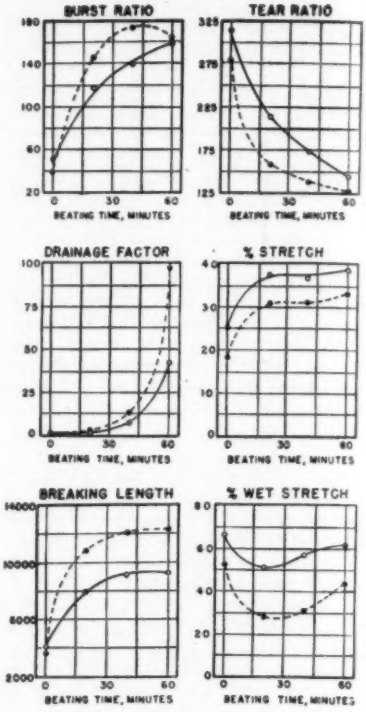

Fig. 6—Effects of curlation on dried bleached kraft pulp after various degrees of beating

○—beaten and curlated
●—beaten only

offer much food for thought in the field of pulp and paper technology.

There is quite a different kind of extreme curlation effect obtained in quite a different way. It is found that increasing the holding time between curlation and the subsequent reslushing of the curlated nodules gives a more pronounced degree of the typical process effect. Holding the nodules one hour produces a noticeable increase, and longer periods strengthen the effect still further. This kind of change is accentuated by holding the curlated nodules under pressure, or by heating them, or in still greater degree by partial or complete drying of the nodules. The obvious explanation would seem to apply for all these after-

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TABLE 3—Miscellaneous Curlation Applications

	Newsprint Groundwood		Groundwood Screenings		Unbleached Sulphite	
	1 Untreated	2 Curlated 8 hp/da. ton	3 Untreated	4 Curlated 40 hp/da. ton	5 Untreated	6 Curlated extreme 50 hp/da. ton
Burst ratio	21.2	19.1	12.3	38.5	89.3	60.0
Tear ratio	62	55	43	85	130	146
Breaking length	2,230	2,060	1,255	3,530	7,560	4,100
% stretch	1.44	1.51	0.81	1.96	1.71	3.60
Bulk, cc. per gm	2.322	2.277	3.418	2.000	1.361	1.299
Porosity (Gurley) sec	22	19	0.5	48	15	51
Stiffness (Gurley) mg	91	83	122	87	121	51
Brightness R_{∞} (570 mu.)	—	—	—	—	62.1	62.1
Printing opacity	—	—	—	—	87.4	90.6
Freeness	94	51	641	108	691	72
Drainage time, sec.	15.6	16.1	4	18.3	4.5	24
Wet strength ratio	0.279	0.177	0.184	0.277	0.840	0.640
Wet breaking length	48	27	47	59	235	115
Wet stretch, %	9.1	12.3	3.7	5.5	3.0	8.3

treatments, namely, that in the curlated nodule the tightly intertwined fibers are still held under light deformation forces, and these forces continue to exert their influence for some time.

Pressing, heating, and drying increase these forces or render the fibers more susceptible to them. The net result is an increased set of the bends, kinks, and twists of the fibers. This explanation is supported by the fact that with tighter, higher-consistency nodules the effect of the after-treatments is accentuated. By selecting certain combinations of after-treatments, extreme changes in pulp properties have been obtained. Sheets of great softness have been prepared from hard newsprint sulphite. Burst has been reduced to near the vanishing point. Tear values of newsprint grade sulphite have been raised as high as 275. It may be added, however, that in progressing toward greater softness by decreased fiber bonding, tear rises to a maximum and then declines, so that with sheets of extreme, low burst, tear may have passed the peak and reverted to near its initial value. Thus a final combination of a 10 burst ratio and a 120 tear ratio is possible for treated newsprint sulphite. Clearly, extreme curlation effects of this nature are not accompanied by any disintegration of fiber structure as occurs with the other class of extreme effects produced by extra-high input of curlation energy.

Referring again to the process itself, there are several additional points which may be of interest in rounding out the present preliminary account. Temperature has quite an effect, both on the curlation operation and on the resulting changes in pulp properties. Higher temperature increases the ability of a pulp to absorb curlation power without smearing and consequent checking of the action, and this has considerable practical significance in the problem of obtaining high capacity from commercial equipment. At the high consistency of curlation, possible raising of temperature is only a minor economic factor. The effect of temperature on the property changes from curlation varies somewhat with the nature of the pulp, but in general a higher temperature works toward a softer curlated pulp, that is, one with lower burst and stiffness, and higher tear, bulk, and freeness. Thus temperature tends to accentuate the typical curlation effect.

Pulp consistency similarly has an influence on the effect of the process, although as noted earlier its influence in the lower consistency range may be tied in with curlation pressure. Futhermore, in practical application, consistency may not ordinarily be an independent variable. Taken by itself, however, higher consistency like higher temperature seems to work in the direction of an accentuated curlation effect, which is towards a heavier set of the altered shape of the fibers and all that this implies in terms of pulp and paper properties. On the other hand, the somewhat separate deshiving effect of curlation seems to be more pronounced at the lower consistency, for example, under 15 per cent.

As noted in the foregoing account, the stretch properties of pulp, both wet and dry, are increased by curlation. Wet stretch is particularly sensitive to the treatment, and gains of 300 per cent are readily obtained on slush unbleached sulphite. Accordingly, wet stretch has proven a very useful guide throughout the course of the development work on the process, and it

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should continue to serve as a convenient aid in defining curlation degree. The test has also supplied added insight to some of the more fundamental relationships of pulp and paper quality. The test used is that developed at the Pulp and Paper Research Institute of Canada by Mr. W. S. Morris and Dr. R. de Montigny. *Pulp and Paper Mag. of Canada,* Vol 42, no. 7:410 (June 1941).

The Curlator—Its Application to High Yield Newsprint Sulphite*

FRANK P. SILVER, Gen. Supt.
Price Brothers and Co., Ltd.
(Riverbend, P.Q.)

The Curlator[1] used in this preliminary work is more than an experimental unit; it is, in fact, the initial commercial scale model representing the difficult jump from small laboratory apparatus. It was designed and built for use in working out the proper characteristics of a perfected commercial machine to follow, and for studying some of the commercial applications of the new kind of treatment[2] performed by the machine, including, but by no means limited to, the application on high-yield sulphite. Similarly, the present setup of the machine in the mill system is experimental in nature with a view to exploring certain possibilities for increasing the yield of sulphite for newsprint, and at the same time to proving out the machine in prolonged operation under mill conditions. The results of the early work have been so generally satisfactory and indicative of still further progress, as to seem of interest for a preliminary report without waiting on the more complete development now in prospect.

Figure 1 is a side elevation of the commercial Curlator, showing features of interest in operation. The stock, supplied from a headbox, enters the center of the machine, progresses radially outward during treatment, is picked up by a rotating turntable at the periphery of the working zone, and doctored off at the stock outlet.

Figure 1a is a cross section and Figure 1b a partial plan of the working zone. The stock at 3% to 4% consistency enters at A through the bore of the rotating sweep and spreads out at B where it begins to thicken. At C the thickened stock, gathered on the perforated plate, is urged outward and upward by the slowly advancing sweep arms and is subjected to motion impulses from the gyrating upper plate tending to form it into balls. At D the stock is forced into a wedgelike space over the top of the sweep arms where it is repeatedly compressed and released by the tractive surface of the gyrating upper plate, all points of which travel in circles in the order of 2½ in. diam. This action continues the formation of nodules and compresses them to a consistency of around 20 per cent while the released water finds its way downward through the perforated plate. At E the thickened nodules begin their rolling traverse between the tractive surfaces of the upper and lower plates. The slight angle of the upper plate provides a clearance pulsation which aids in advancing the nodules radially outward at this point. In the balance of the working zone G, the nodules are rolled in all directions under compression between the upper and lower plates. Their path of motion is generally circular with gradual progression toward the periphery of the plates where they are discharged onto the turntable. The bypassed water rejoins the nodules at the stock outlet.

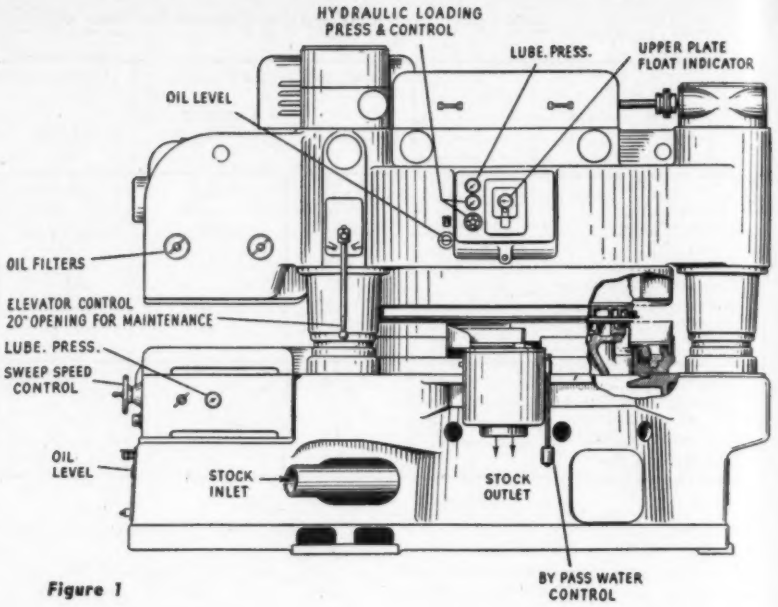

Figure 1

The upper plate is free to float vertically and the degree of compression applied to the rolling nodules is controlled by oil hydraulic pressure (loading pressure) communicated to the upper plate by the thrust columns. The thrust columns also serve to hold the upper plate parallel to the lower plate and to prevent its rotation about the central axes. Operation of this machine is a relatively slow speed and low power operation. Gyratory surface speed of the upper plate is in general below 300 ft/min. and the sweep is generally below 20 r.p.m. Power consumption may range up to 75 h.p. for a machine having a plate 53 in. diam. and capacity to process up to 40 a.d. tons per day. Although the pressure on the nodules may be in the order of 1800 lb./sq. ft. of plate area, there is little or no water pressure in the working zone G. The nodules alone support the load.

The degree of treatment administered to the pulp, as well as the power consumed by the machine, is controlled by the loading pressure with essentially no effect on the throughput. The throughput is controlled by adjustable gates in the headbox, or by pressure control on the bypass water, or by the speed of the sweep with essentially no effect on the power consumption. The clearance between the working plates may vary up to ½ in. and, since clearance is a handy guide to throughput and working conditions, a "float" indicator is provided. Variation of supply consistency does not affect throughput or degree of treatment but only affects the quantity of the bypassed water. In case steam is used to raise the temperature of the nodules it is added through a ring of nozzles outside the de-watering zone.

First let us examine the sulphite screening system at the Riverbend mill as depicted in Figure 2. The pulp, after the blowpits, passes over primary Jonsson knotters. The rejects from the knotters are sent over a secondary Jonsson knotter. The rejected knots and chip bundles are sent to a refining set up for final lapping and despatch to the

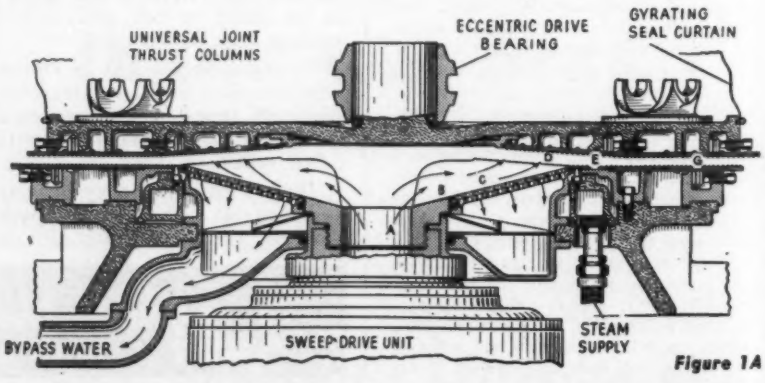

Figure 1A

(*) Abridged from paper presented at the annual meeting of the Technical Section of the Canadian Pulp and Paper Association, Montreal, Quebec, January 26-28, 1949.

(1) Trade-mark. Process and apparatus patents pending in United States and foreign countries. (2) Hill, Edwards and Beath, paper presented at same meeting as this one, and a part of proceedings.

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wrapper machine at our Kenogami mill. The accepted pulp passes on over a vacuum washer, through the rifflers to the primary rotary screens. The accepted stock from the primary rotaries passes to the primary flat screens from where the accepted fiber goes to the deckers. The primary flat screen rejects pass over secondary flat screens, the accepted from these going to the deckers, the rejects going to a secondary rotary screen where they are joined by primary rotary screen rejects. The accepted from this secondary rotary screen goes back through the screening system; the rejects flow into the wet lap system for the board mill at Kenogami.

Past experience with the high yield pulps had shown that such pulps contain a reduced proportion of free fiber, and an increased quantity of soft white shives or fiber bundles, plus harder brownish chips and, of course, knots of various sizes. We had learned, too, that the Curlator had a throughput on this type of stock of approximately 30 tons per day. We could not, therefore, expect to treat the full mill requirements of 120 tons of sulphite per 24 hours. It was obvious that the regular screen system would accept the free fiber in the high-yield pulp. Why not then apply the Curlator to the rejects only? In this way we felt sure that the fiber bundles and chips would be broken up and processed into acceptable fiber for the paper machines. With a pulp of 3.5 chlorine number, approximately 4% of the production was being rejected or about 5 tons per day, into the wet lap system for the Kenogami board machine. It was felt that most of this could be treated and converted into acceptable fiber for newsprint. We reasoned, that, even if a higher yield pulp did increase the secondary rejects considerably, we could treat them at the Curlator established throughput. We decided to proceed on this scheme and find the limit we could reach with the one Curlator.

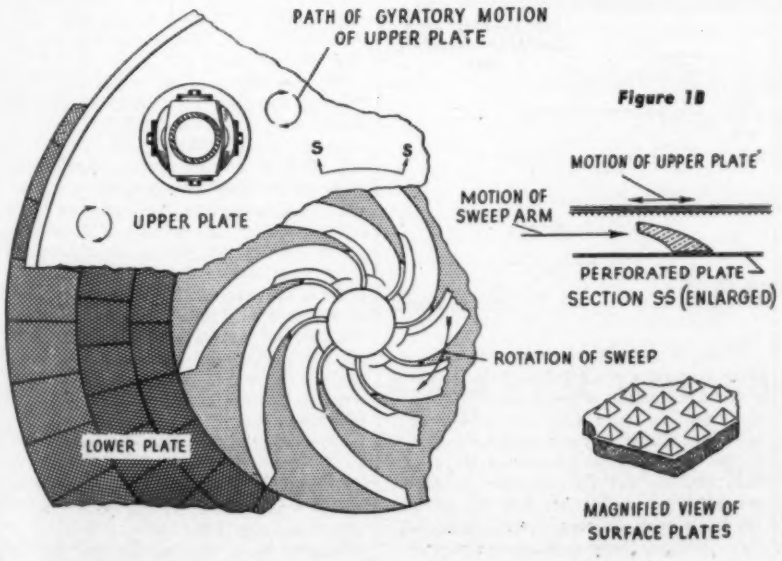

Figure 18

The first step was to ensure that all chips and fiber bundles, even small clean knots, were accepted into the screening system. After several trials we equipped our secondary Jonsson knotter with a plate having 11/16 in. diam. holes instead of the regular ¼ in. diam. holes. With properly adjusted showers only the very large knots were then rejected. The chips and fiber bundles now fell into the accepted pulp from the

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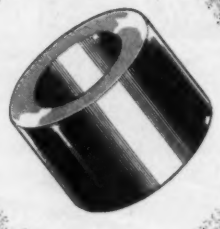

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primary knotters and passed on into the screen system. Even with some breaking up of fiber bundles as they passed through the pumps the rejects from the primary screens of course increased and were passed onto the secondary screens. However, the rejects from the secondary screens, instead of being allowed to pass off into the wet lap system for wrapper use, were diverted to one end

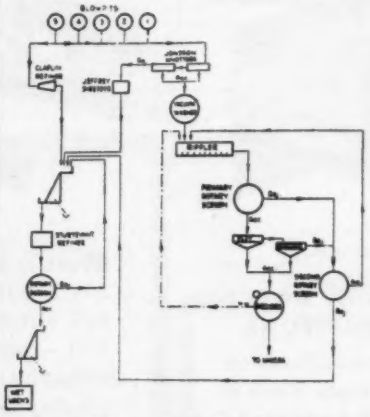

Fig. 2—Before Curlator installation

of a spare tank which was bulk-headed to make two tanks. Let us observe, then, the Curlator setup as shown in Figure 3. The thin stock from this tank is pumped over an inclined 60 mesh wire where it is thickened. This stock falls into the other end of the divided tank. From here it is pumped into the headbox controlling the flow to the Curlator. After discharge from the working surfaces, fiber and white-water rejoin on the intake side of a pump which sends the pulp to the washer tank. From here it flows back through the whole screen system where sufficiently treated fiber is accepted and rejects are returned for additional passes through the Curlator until they are accepted.

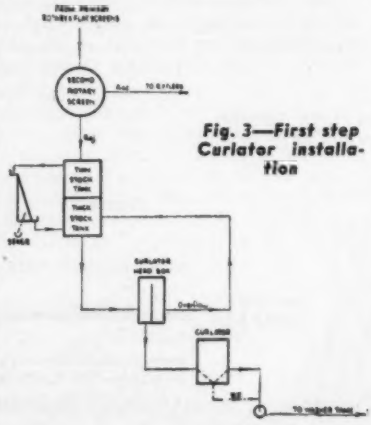

Fig. 3—First step Curlator installation

With the system in operation, we began at once to increase the sulphite yield. From a chlorine number of 3.5 we gradually worked up to six. The rejects from the second rotary screens increased, of course, and were passed to the Curlator. The amounts of chips and fiber bundles had increased but were yet white and soft in character. The soft, brownish small knots defibered satisfactorily. We were, however, now treating rejects at the

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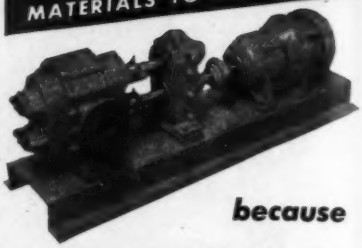

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rate of 25 tons per day with working surfaces having 16 pyramids to the inch, and it was considered advisable to introduce a preliminary treatment just prior to the Curlator as a means of increasing its throughput and also to decrease the run around of the harder fibers which were not sufficiently reduced on the first pass to be accepted by the screens. Before increasing the yields further, a small jordan which we had on hand was installed in the line just before the Curlator headbox. We also installed working surfaces having eight pyramids to the inch. The system was now as illustrated in Figure 4.

We now continued our programme of increasing the pulp yield and the chlorine number rose to 10. The total yield had now increased from 47% to 52%, a gain of 5%. This is a fairly accurate figure. The chips are weighed into process by a Merrick belt weightometer that is checked weekly by means of a chain test and monthly by certified railway weights of cars of imported chips from the company's sawmills. The pulps to the paper machines are gate-metered at the mixers. Proper chip moisture and density tests are taken at frequent regular periods during the operating day. Pulp samples for chlorine number tests are taken from the blowpit discharge line and also at the riffler headbox.

Our sulphite pulp had now taken on a harder character. There were now considerable amounts of harder chips in the stock, which were rejected at the second rotary screens and sent to the Curlator. From observations at blow time we felt that we had

reached the point where any further increase in yield would begin to cause digesters to hold stock during the blowing period, a fault which had been overcome during the previous regular operations by using a hot waste liquor wash-out system. We felt that the existing wash-out pump did not have the capacity or pressure head that would be required to loosen harder cooks. Furthermore, the position and size of the blowpits in relation to the digesters and the sharp

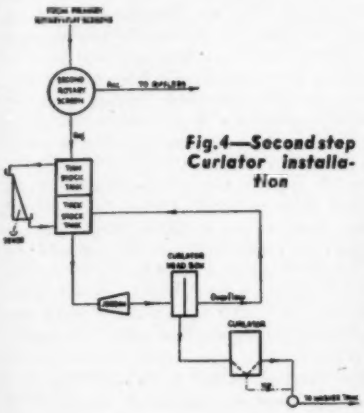

Fig. 4—Second step Curlator installation

upward angle of the blowlines, we felt, would cause plugging during the blowing of a higher yield pulp. We are now taking steps to find means of overcoming this problem.

The quality of the sulphite which was being produced compared favorably in every way but one with that of the previous stock. Mullen remained about the same. Tear and stretch increased. Color remained good. However, dirt did increase. This was caused by the fact that we were retaining in the screening system the knots and dirt that pre-

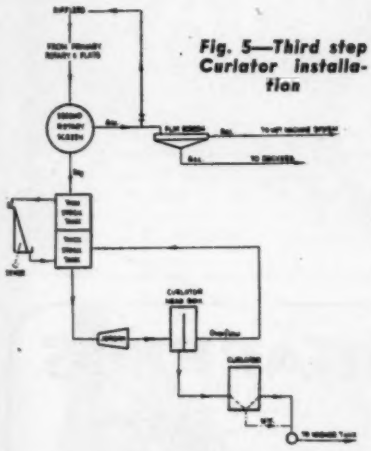

Fig. 5—Third step Curlator installation

viously were rejected for ultimate use in wrapper furnish. This build-up of dirt, after repeated passes through the Curlator, became small enough to be accepted by the primary flat screens. In the development period, the Curlator had treated No. 1 sulphite at a chlorine of 3.5 and had demonstrated conclusively that it did indeed almost eliminate dirt by rubbing and reducing it to infinitesimal size.

We realized that with the Curlator in operation, the system was a closed one and was accepting to newsprint almost the total digester yield. Steps were taken to provide a bleed for the dirt by installing one additional line of flat screens, which was not in use, to screen the accepted stock from the second rotaries before returning it to the primary system. The rejects from the flat screens thus setup, containing most of the larger dirt particles, were sent into the wet lap system for the wrapper machine (Figure 5). The fiber loss was negligible. This setup reduced the run-around of dirt and brought the pulp cleanliness back into line with that of the previous No. 1 pulp. Dirt from incompletely barked slabs chipped elsewhere and shipped to the mill has always been a problem. The screen room flow sheet now is as illustrated in Figure 6.

Using high-yield sulphite in our news furnish proved entirely satisfactory and occasioned no change whatever to the machine operations. Paper quality remained constant in all respects. The increase in dirt in the sulphite pulp at first experienced did not materially affect the appearance of the news sheet due to the relative percentages of sulphite and groundwood. After the flat screen setup was put into operation to bleed off dirt the news sheet became in every way equal to the previous quality.

The Curlator as we have applied it is essentially a refiner. The principle on which it operates, however, results in a very low

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power input. For the type of pulp with which we have operated during the past eight months, approximately one to one and a half horsepower per ton of treated pulp has been required. Stock feed pressure to the Curlator is easily and simply maintained at about 3 psi by means of an overflow headbox with an adjustable dam. Feed consistency is 3% to 4%.

The Curlator de-waters the stock considerably before treatment so that exit consistency is about 20% to 25%. The white-water thus extracted re-unites with the sulphite nodules immediately after the Curlator and is pumped back into the screen system. The Curlator has a capacity on the high-yield pulp rejects of 45 tons per 24 hours. We find that the best treatment is given if we maintain a throughput of 35 to 40 tons and so arrange the rejections as to maintain this rate to the Curlator. The set clearance between the working surfaces is 0.180 in. The float of the upper oscillating surfaces, which move at 150 fpm at a throughput of 40 tons per day, is about 0.090 in., making a total space between working surfaces of 0.270 in. Variation of throughput, if desired, is accomplished in part by regulating stock input head and by regulating the speed of the sweep. It revolves at a speed of about 18 rpm. Stock temperature is regulated by steam through built-in nozzles to about 140 Fahr.

Maintenance other than replacing working surfaces has been negligible. The Curlator prototype has stood up under various excesses imposed during the development work and has given very little trouble during the period of eight months it has been operating on a mill scale. Working surfaces have had an average life of ten weeks and this is also expected to be bettered in the commercial machine by improved material and design.

Because of its temporary location, we have had one operator per shift in charge. From our observation, we feel that the Curlator will not require constant attention when located in its permanent place. It is expected that the regular screenman will be able to include this work with his present duties under the supervision of the stock runner.

The increase in yield from 47% to 52% has, in effect, resulted in a saving of wood to process of 10%. At present day costs per cord or prepared unit of wood this means a very substantial dollar saving per ton of sulphite produced. Approximately 10% savings in steam and chemicals has been experienced. Increased dollar value of pulp produced results from the fact that that portion of each cook which produced screenings suitable only for wrapper has, by treatment on the Curlator, become No. 1 pulp suitable for newsprint.

In our sulphite mill, with five digesters, we have one digester so installed that we can use it to cook inferior wood to produce pulp suitable only for wrapper. It was possible during the development work to use this digester for high-yield cooking, and, by installing another spare knotter and rotary screen, set up a separate pulp system which included the Curlator. We were thus able to curlate entire blows of high yield pulp. Two such blows of 52% and 55% were treated and piped to the mixers in such a manner that one newsprint machine received all curlated high-yield sulphite in its furnish for a period of several hours. It was gratifying to note that no changes to paper machine operations were necessary. The quality of the sheet remained equal in every way to the standard.

Our Research Department has indicated that the limit of high yield may be 70-75%. This certainly would require some other means than we now have for removing pulp from the digesters, and possibly a shredding step before the Curlators. But we shall learn as we progress by gradual steps what the ultimate commercial goal will be.

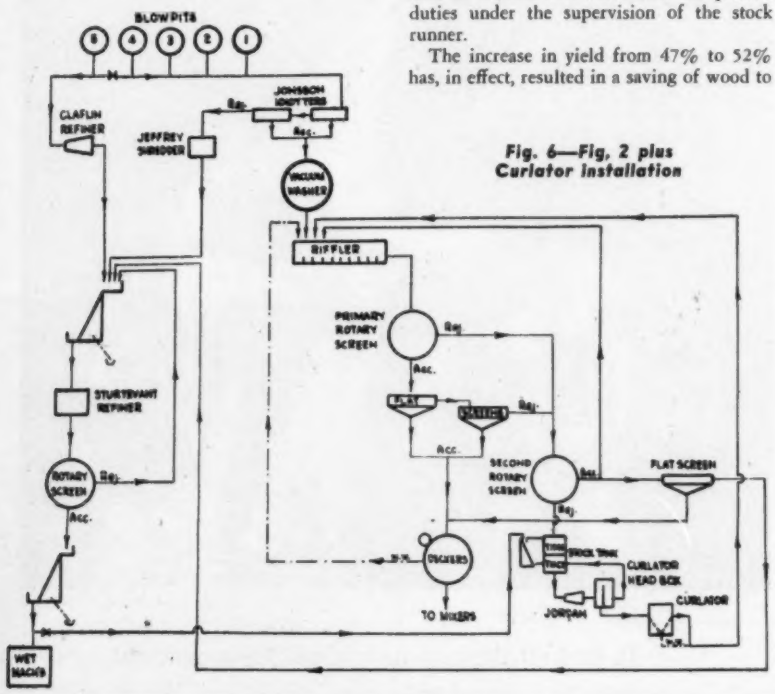


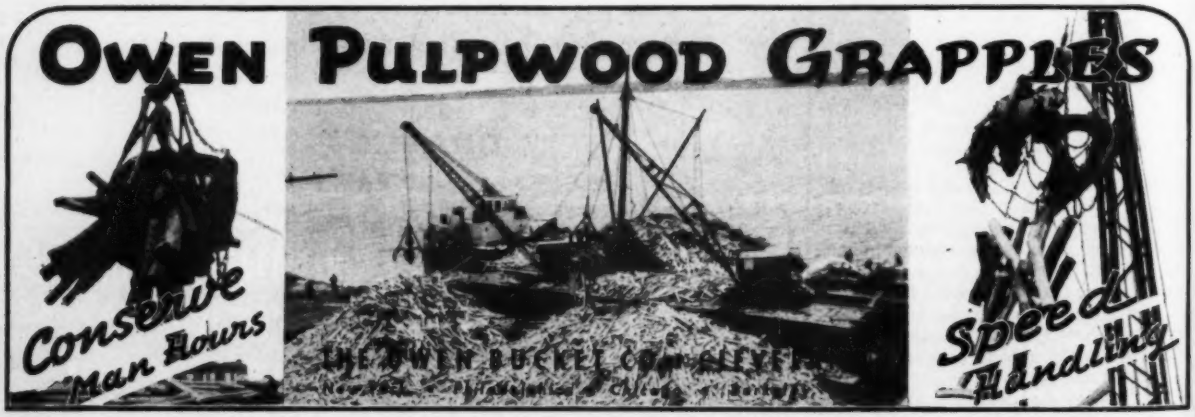
Fig. 6—Fig. 2 plus Curlator installation

▼

Zinc Hydrosulphite in Brightening Eucalyptus Pulp

The Australian Newsprint Mills Ltd., of Boyer, Tasmania, is using zinc hydrosulphite successfully in the brightening of the reddish brown groundwood obtained from the Tasmanian eucalyptus woods. This appears to be one of the first times this treatment has been applied to hardwood pulps.

The treatment also removes the bluish coloration caused by contact of the hardwood with iron. The hydrosulphite solution is added soon after the pulp leaves the grinders when it is still at 140 to 150 Fahr. *Chem. Eng.* 55, No. 11,251 (1948) through *B.I.P. Chem.* 19, 227.



New EQUIPMENT and SUPPLIES

Lightweight Fiber Strapping

A fiber strapping which will be made in different widths and thicknesses to meet strength requirements is a new product announced by The Simonite Company, Bedford, Indiana.

Simonite strapping (made of kraft paper with a plastic binder) is the outgrowth of a weaving material invented by Company President L. A. Simons during the thirties and used in the manufacture of furniture. The uses for which this strapping is especially suited include the banding of cardboard cartons for shipment of dry goods and other textile goods, as well as paper and paper products. It may be used on parcels for shipment via parcel post as well as by express or rail freight.

For use with the strapping, a stretcher and a tie fastener have been invented by the company's president. The stretcher will be sold at a nominal cost with the strapping, thus eliminating the stretcher rental plan.

Industrial Pinch Valve

Designed to handle corrosive liquids, semi-solids and dry granular materials, the *Wilcox* rubber pinch valve has given unusual service in a variety of industrial jobs. This non-clogging and non-corroding valve, available in most common sizes, is manufactured by Ray Wilcox, 1436-37 Land Title Bldg., Philadelphia 10, Pa.

It is comprised of three essential parts, namely (1) rubber tube, (2) pinching mechanism and (3) housing. The straight round tube with integral flanges is built of natural rubber compound reinforced with woven duck plies. Operating or pinching

mechanism consists of a steel yoke with two half round steel members that are brought to a closing position by a screw arrangement. When the hand wheel is turned in a closing direction the upper pinch bar descends and the lower pinch bar rises compressing the tube until it is sealed at the center line.

All operating parts, including the non rising bronze screw are contained in a sealed cast aluminum alloy housing. Where desired, housings of cast iron, stainless steel, etc., can be supplied. While the standard valve tube is made of natural rubber, it is also available in various synthetic rubbers for applications that cannot be handled by natural rubber. Because the rubber tube is not fixed permanently within the valve housing, riding free when the pinch is off, its position can be changed by removing flange bolts and rotating the tube part of a turn to assure even wear on all sides.

The Wilcox valve is especially recommended for use in pipe lines handling pulp and paper stock, acids and salt solutions, lime slurry, wet and dry ash, granulated slate for roofing manufacture, and other abrasive and corrosive slurries and liquids difficult to handle or injurious to metal valves. It can be used on any line except those where the material being transported is damaging to rubber or where high temperatures are involved.

Resistance of the rubber tube to abrasion and corrosion is said to be many times greater than that of the interior metal parts of gate or plug valves. The valve is easy to close, because the rubber compresses around any coarse particles, and overcomes difficulties encountered with metal valves

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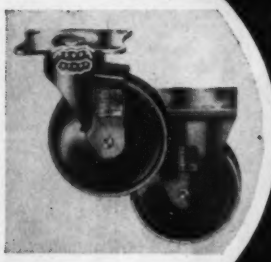

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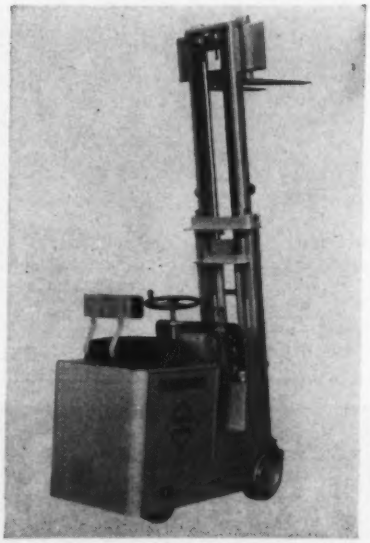
where coarse particles obstruct the closing of the valve. Also, it can be used in locations exposed to freezing weather where metal valves tend to freeze up.

Some other advantages claimed for this valve are that it provides excellent control, assures leakproof shut-offs, gives long life under most severe conditions, and requires no maintenance over a long period of time. All operating parts are outside of the rubber tube, assuring fee flow with no jamming, and no effect on the mechanism. Working parts are sealed against atmospheric attack, acid fumes, moisture, and dust accumulation.

Lightweight Truck

A relatively small lightweight, electric power industrial truck for fast maneuvering and tiering loads that are not excessively heavy has been developed by Elwell-Parker Electric Co., Cleveland, Ohio.



This new truck weighs only 4550 pounds including battery, yet it can safely manipulate loads up to 2000 pounds. This feature makes it suitable for continuous work where floors and elevators are of moderate capacity.

Length overall with 30-inch fork is only 96 inches; width 32½ inches. This with straight-line steering mechanism enables it to turn in 60-inch intersecting aisles and in 109-inch right-angle aisles. A low center of gravity contributes to safe-handling under all working conditions. Straight travel speed with full load is 5¼ miles an hour. Maximum height of lift of fork is 121½ inches. Lifting speed loaded is at a rate of 28 feet per minute; lowering load rate 45 feet per minute. Safety valves control lifting and lowering.

A dual-cylinder, low-pressure hydraulic system operates the lifting mechanism. Cylinders placed at opposite sides in the upright column provide extra unobstructed vision for the operator. He sits on a form-fitting, air-foam cushion with back rest and he can step on or off the truck from either side.

Corrosion Resistant Coating

A corrosion resisting coating for wood tanks, floors, racks, tables, fume hoods, and miscellaneous equipment is announced by Carboline Co., 502 N. Taylor St., St. Louis 8, Mo.

Designated as Carbo-Kote, it cannot be separated from the wood. Joints made with it are stronger than the wood itself.

Carbo-Kote resists most acids, alkalis, solvents and mixtures of such corrosives. Chief exception is nitric acid, also sulphuric acid over 45% concentration. The surface is hard; it resists wear and is easy to clean. Carbo-Kote is waterproof; it begins to be affected at 325 Fahr. Even then it simply decomposes slowly over a period of time. Carbo-Koted wood structures have been known to char under great heat, yet the coating itself has remained intact.

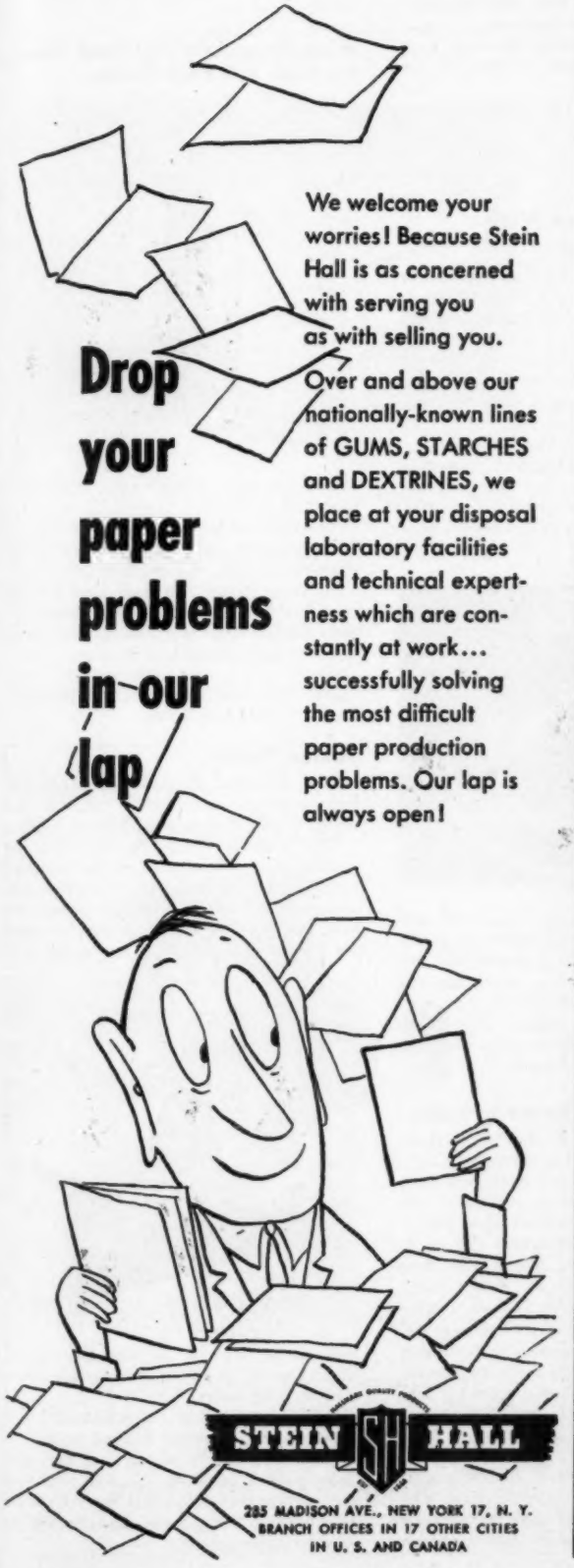
After setting, it will flex about 10% to 15%. It "sets" by polymerization at room temperature. Neither evaporation nor oxidation are involved in application or use. The coatings are inert to further breakdown after being formed. It may be applied with an ordinary paint brush at ordinary temperatures. Developed primarily for coating wood, Carbo-Kote works equally well on rubber, carbon and fiberglass.

Dead-Weight Thickness Caliper

A new micrometer, manufactured by E. J. Cady & Co., 134 No. LaSalle St., Chicago 2, Ill., calipers thicknesses of sheet materials or other articles up to ½ in. It provides a thoroughly accurate thickness measurement for steel, plastics, papers, boards, mica, felt, glass, foils, aluminum, or any sheet stocks with thickness within its range of operation.

The dead weight principle employs devices to maintain uniform measuring pressure at all times, at any point of anvil travel, whether the article measured is thick or thin. The top lever lifts the anvil. It descends by gravity, a dash-put action preventing too-rapid descent. The pressure per square inch meets ASTM and TAPPI standards.

This instrument is provided with zero adjusting devices, accessible from outside the frame, permitting the indicator to be set at exact zero on the dial. Internally, the mechanism is designed to prevent an accidental change of this zero adjustment and maintain perfect alignment of working parts. The dial is 6 in in diameter, clearly marked (thousands or half-thousandths of an inch graduations), glass covered, and located for convenient accurate reading.



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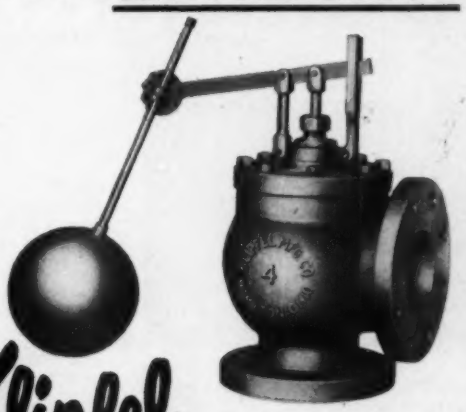

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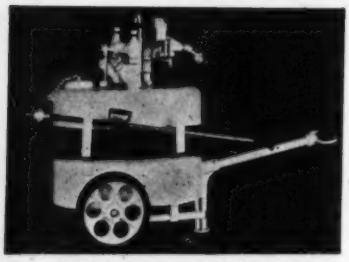
High-Pressure Jet Cleaner

For fast and thorough cleaning of plants, processing equipment and machinery, the Sellers Injector Corp., Philadelphia 30, Pa., announces a new portable *Hi-Pressure Jet Cleaner*. Designed for use in food, chemical, general industrial plants and the service industries, the Jet Cleaner removes process residues, slime, dirt, oily sludges, and similar matter not removed by previously existing types of equipment.



Portable and simply operated, the Jet Cleaner has a self-contained 50-gallon tank for a detergent, a 50 ft pressure-type hose and nozzle with operating controls for various cleaning jobs. Only connections to a steam and water line are required. There are no moving parts. High pressure and high temperature water shoots from the nozzle and, if desired, the jet is uniformly mixed with the desired amount of detergent. Jet pressure is adjustable up to approximately double the initial steam pressure. Both temperature and amount of detergent are also adjustable.

The Hi-Pressure Jet Cleaner permits thorough cleaning of many types of equipment such as conveyor systems, machinery, heat exchanger bundles, etc., with dismantling.

Unique Clamp Has Wide Range of Take-up

A new and uniquely different type of low pressure clamp for use with flexible conduits has been introduced by the Flexible Tubing Corp., Branford, Conn. This new clamp, known as *Flexfast,* provides fast, positive clamping action over diameters from 1½ in to 37 in each size having an unusually wide range of take-up.

Flexfast is not a one-time clamp, it requires no tools for quick and easy set-up or release. In place of the usual worm or screw take-up mechanism, it combines an overlapping, one-piece, nonrusting metal clamping band with a strap and buckle take-up.

It is constructed of only three parts permanently integrated into a single unit. Nothing to get lost or out of order. And this new clamp is designed to give long life under rough service conditions. It is particularly adapted to factory maintenance and production operations. Also, wherever semirigid or flexible tubing is used.

Rubber-Covered Butterfly Valve

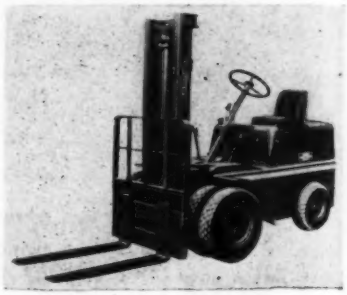
Recently developed by the W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn., is a *Wafer* butterfly valve with both body and vane entirely covered with latex rubber, and with stem made of Hastelloy. It fits easily into a piping system that is entirely rubber-lined, and will handle those corrosive fluids or gases for which rubber, either natural or synthetic, is most suitable.

With the valve body wafer-thin to fit into close spaces between connecting pipe lines, and with a smooth body and vane interior, there is a minimum resistance to flow, hence minimum pressure drop. Control may be manual or any of the automatic types such as electric motor, air diaphragm, hydraulic or solenoid control. Since the valve is not required in this case for tight shut-off, the vane has been made to turn 360 degrees; however, it can be made for wedge-tight shut-off expected of butterfly valve closure.

Sizes range from 4 in to 72 in, designed as standard for operating pressures below 25 psi, but can be designed for pressures to 100 psi.

Wide Drive Axle and Dual Tires for High Lift Fork Trucks

To provide better stability and safety in high-lift operation of pneumatic tired fork trucks, Clark Equipment Co., Battle Creek, Mich., has built a new wide drive axle, mounting dual tires.

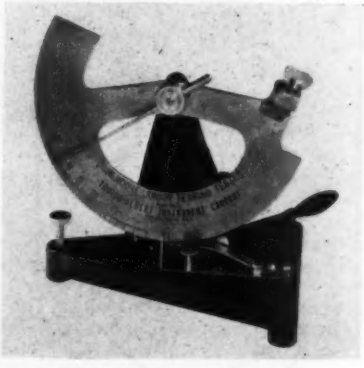


This new axle is recommended for all Clark *Yardlift "40"* models where operations require lifts of more than 144 inches. Tests have shown that dual tires provide considerably more traction and greater flotation; which result in smoother, safer operation over soft ground and on many surfaces so rough as to be unsafe for solid tired machines. The axle is now available for either factory or field installation.

Junior Tester

The Elmendorf Junior Tearing Tester is being presented as a smaller running mate to the Standard Elmendorf Tearing Tester.

The Elmendorf Junior Tearing Tester has a capacity one-eighth that of the standard instrument. The total capacity is 200 grams, making it ideal for lightweight papers, tissues, plastic films and materials too light for testing on the standard instrument. It is available in any one of four calibrations, direct reading in grams when testing either 1, 2, 4, or 8 sheets.



In appearance, the Elmendorf Junior is similar to the Standard Elmendorf, but on a smaller scale. The principle of operation is the same. A carefully calibrated pendulum provides the driving force to tear the sample held between two pairs of jaws. Results are as constant as gravity.

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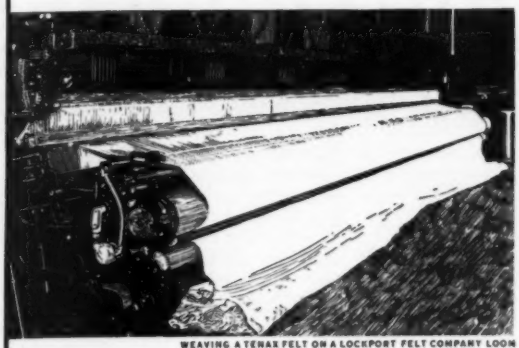

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in American and foreign press.

Paper Tension and Register

Perfect register is required for quality printing, but is difficult to maintain without some means of compensating for changes in paper tension which directly affects the length of the stock. Various methods are used to accomplish this, such as the use of a friction brake on the stock roll shaft, a slip clutch on the windup roll and a variable speed drive between the press and the stock roll and between the press and the wind-up roll. Such methods can be used to correct errors in register, but only after they have occurred.

The most accurate means of measuring tension is to take the indications from the material itself. This is accomplished if a loop is inserted in the web and a rider roll placed in the loop. The weight on the rider roll determines the length of the loop. By making a connection from this roll to a controller which operates when the length of the loop changes [and which controls the speed of the variable speed drive turning the stock roll] a means is provided for turning this roll at exactly the speed required to maintain the instantaneous length of the loop for any value of weight on the rider roll and therefore the tension on the web. The length of the loop will also vary in direct proportion to the diameter of the stock roll. The system furnishes a method for feeding the paper web into the press at a controlled tension or velocity.

Control is maintained for any operating speed required of the press. The above installation adds practically no extra load on the main press drive system, and maintenance and operation are simple. The article is illustrated giving a schematic diagram of the equipment. J. H. Gepfert. *Printing Equipment Engr.* **76**, No. 6, 21 (1948) through *Bull Inst. Paper Chem.* 19, 188 (1948).

Diazotyping

Diazotyping involves the technique of reproducing documents on papers sensitized by the use of diazonium salts. The author discusses the chemical theory of the process and the advantages of the process over that of ferrotyping. The more important requirements of the paper are uniformity, resistance to handling in the dry and semi-wet state, dimensional stability under varying moisture conditions, and a white or bluish background to compensate for slight yellowing on storage.

Diazotype papers are classified in accordance with the constituents of their emulsions. There are five classes: (1) those containing the diazotized compound whereas the coupling compound (usually a phenol) produces the color in the developer; (2) those containing both the diazo compound and the developer as well as an acid which prevents premature coupling (the image being formed by an alkaline agent like ammonia gas); (3) those containing the diazo compound and an addition product which when treated with an alkali gives rise to a suitable coupler; (4) those containing a diazo compound which decomposes partially to give rise to a coupler; and (5) those containing a diazosulphonate and a naphthol. In practice however the papers are commonly classified in accordance with the method used in developing the image—*i.e.* by the dry or semi-wet process. These procedures are described in great detail as are the developers used.

A description is given of the various components used in manufacturing diazotype paper, and their preparation, storage, exposure, and development. The use of the diazo-derivatives in photography is discussed briefly. Robert Delattre. *Chimie et Industrie* 60, No. 3, 233-40 (1948) (In French).

Electronic Controls in the Paper Industry

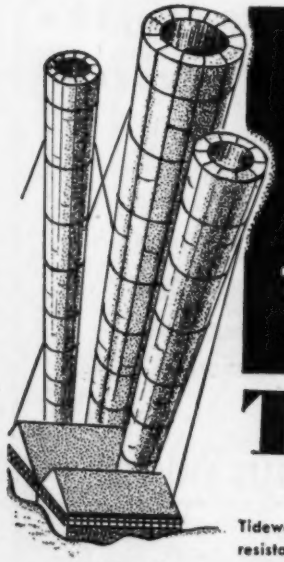
The theory of photoelectric cells and vacuum tubes is briefly outlined and this is followed by a discussion of possible applications in the paper industry of electronic controls for various speed motors, for different types of regulators, for the running true of paper web, for the operation of cutters, counting sheets, and for detecting defects in the paper, etc.

Supplemented by schematic diagrams, the electronic control of the conversion of ac current for dc motor operation and the synchronization of the various sections of the paper machine with a sectional drive are described. G. Massot. *Bull. assoc. tech. ind. papetiere 2*, No. 7, 129-138 (1948) (In French).

Problems Connected with the Fourdrinier Paper Machine

The authors consider the entire paper machine operation as a complicated example of fluid flow and claim that the Fourdrinier machine has not received the chemical engineering attention that it deserves. In part this is due to the complexities of the problems and in part to the cost of such investigations. Some of these problems are touched upon in the present article. Referring to a typical high speed newsprint machine operating at 1550 ft/min at Baie Comeau, Quebec, the flow of stock was followed critically from the head box and slice over the wire, through the press and drier sections. A number of high speed flash photographs and diagrams are given.

The problems of flocculation or clot formation (and how to avoid these), the drainage on the wire, and the part played by table rolls, the use of suction presses in place of plain presses and the best possible drier conditions are all given attention. Ordinarily the fourdrinier is too large and its



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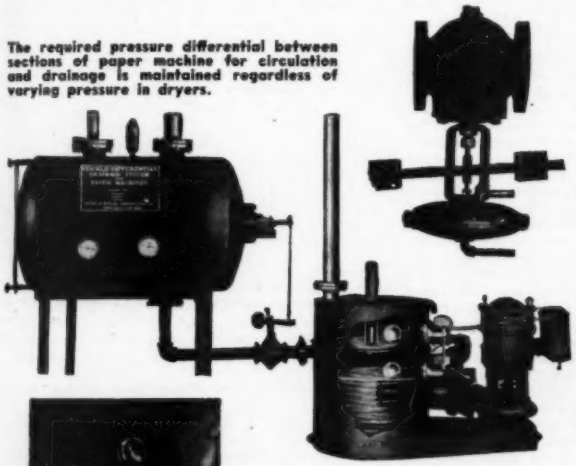

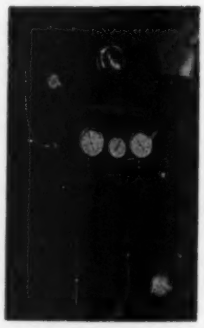

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operation is too costly to permit experiment, and so some simpler method is required to produce results that should be definitely predictable before attempts can be made to build a full-scale machine along new lines. The challenge is all the more important because of its economic significance. C. A. Sankey and B. Cowan. *Chem. Eng. Progress* 44, No. 10,745 (1948) through Bull Inst. Paper Chem. 19, 169 (1948).

Superiority of Esparto Papers

Esparto papers show superiority in ability to print well with less pressure. The fibers keep their shape well and the ends remain unfrayed after beating. Wood fibers flatten and fray. Paper made from esparto has an aerated structure in contrast to paper made from sulphate pulp. Thus esparto has a greater bulk with less weight and also has greater resilience. On the other hand, esparto papers require careful processing to eliminate impurities which otherwise may be seen in the look-through or on the surface of highly finished paper. Because of their air cavities, esparto papers can absorb surplus moisture readily and thus furnish a consistent moisture content over the entire sheet more quickly than those papers made from wood pulp. If properly aged before packing, esparto papers are claimed to react less unfavorably to subsequent variations in humidity. Anon. *British Printer* 61, No. 363, 42-4 (1948); through *B.I.P. Chem.* 19, 237. (1948).

New Catalogues and Publications

Paul O. Abbe, Inc., 145 Center Ave., Little Falls, N. J.—Just off the press is their new illustrated Catalogue "V," describing the company's latest developments in mixers for dry and paste mixing; double cone blenders for dyestuffs and chemicals, and jar mills.

Allis-Chalmers Mfg. Co., S. 70th St., Milwaukee, Wis.—Two new bulletins are now available from this company, upon request. The 12-page Bulletin 14B7132, "Alternating Current Across-the-Line Motor Starters," covers its line of alternating-current full voltage starters to meet the requirements of any type of motor drive. Construction features and uses of magnetic and manual across-the-line starters; across-the-line combination starters; reversing starters, and push-button control stations are described and illustrated. The second bulletin, 05B7150, "Totally Enclosed Fan-Cooled Motors," lists nine outstanding features of these motors and their tube-type air-to-air heat exchangers. The problem of efficiently removing heat losses without exposing electrical parts to harmful atmospheric conditions, is said to have been solved in these motors. They are particularly adapted for use as power plant auxiliaries. For chemical plant installations, tubes, stator end plates and external fan can be made of stainless steel or other non-corrosive metals.

Armstrong Machine Works, Three Rivers, Mich.—Of special interest to paper makers will be their 12-page bulletin, No. 1771, "Controlled Humidification." It describes this company's steam humidifiers for automatically controlling relative humidity for prevention of dry air damage to hygroscopic materials such as paper in storage or in process. The effect of relative humidity on human comfort and health, and elimination of fire and explosion hazards of static electricity where inflammable vapors, waters or liquids are present, is also explained. Helpful tables aind charts are included.

American-Marietta Company, Valdura Division, 43 East Ohio St., Chicago—An invaluable guide for plant superintendents, maintenance engineers, purchasing agents, industrial architects, painting foremen, etc., is available from this company. The new volume is entitled, "Plan Before You Paint Your Plant." The booklet tells how selected colors increase production by improving visibility; how color reduces accident hazards, and decreases work fatigue and absenteeism. An exclusive feature of the book is a Dial-A-Tone color selector, with which 108 tested foolproof combinations can be viewed. Five-color printing gives eye appeal to the simply-written prose. Emphasis is placed on the correct selection of the right finishes for the right surfaces, as equal in importance to the selection of a planned color system. Inside the back cover is an array of paint chips, showing ceiling, wall and dado finishes.

Bowser, Inc., Fort Wayne, Ind.—Now available from this company is a four-page illustrated bulletin, "The Modern Way to Clean, Stabilize, Dehydrate and Degasify Transformer and Circuit Breaker Oils." Details of construction and case histories are included.

The Bristol Co., Waterbury 91, Conn.—Just published by this company is a new bulletin, P-1238, "Thermocouple and Pyrometer Accessories Buyers' Guide and Users' Manual." Its 56 pages of detailed information on thermocouples, protection tubes and other pyrometer accessories include engineering handbook data; illustrations of typical installations; a catalogue section which is indexed and liberally illustrated with drawings and photos, and tables of calibration data.

Bucyrus-Erie Co., Hydrocrane Div., 7923 W. Greenfield Ave., Milwaukee, Wis.—A 12-page booklet has been issued by this company descriptive of its Hydrocrane, a hydraulic truck-mounted crane. Colors are used, as well as photos and drawings, to show the important features of this new crane.

Burrell Technical Supply Co., 1942 Fifth Ave., Pittsburgh 19, Pa.—Now available is Bulletin No. 213, "Industro Gas Analyzers," descriptive of their instruments for the control engineer, plant operator or laboratory technician.

Clark-Aiken Co., Paper Mill Machy. Div., Lee, Mass. Illustrated and fully described in Bulletin 101, is the new rotary paper cutter. Information about accessories is also given.

Cleveland Worm & Gear Co., 3293 E. 80th St., Cleveland 4, O.—Case histories of typical installations of the Speedaire gear speed reducer are included in a bulletin available from this company. Among them is a Speedaire unit driving a 54-in. stainless steel propeller in a bleacher tank in a paper mill. Catalogue 300 describes this unit.

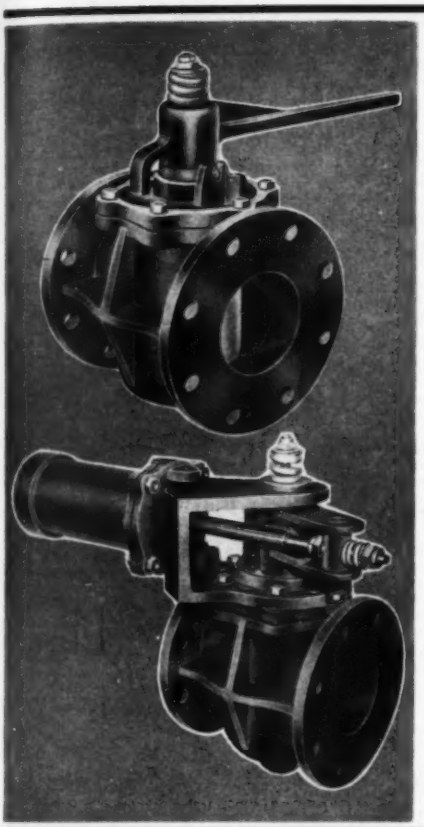
Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.—A new booklet, "Packing for the Chemical Industry," may be had from this company. It is intended to give a complete picture of packing requirements for practically all chemical applications. Recommendations are made for specific services and temperatures. A special section is devoted to Chemlon, the new chemically inert packing.

De Laval Steam Turbine Co., Trenton 2, N. J.—Of great interest to the paper industry is Bulletin No. 810-1, issued by this company, describing and illustrating a new line of pumps to meet the special needs of the paper manufacturer. Sections are devoted to stock, white water, liquor and frame mounted pumps.

Robert Gair Co., Inc., 155 E. 44th St., New York 17, N. Y.—Distributed free to users of shipping containers is a booklet, "Air Cargoes," giving full information on shipping by air, also the advantages of the fiber containers for air shipments. Write to the above address.

The B. F. Goodrich Co., Akron, O.—A new Catalogue Section, No. 2170, on its multicord and grommet Multi-V belts has been issued by this company. The construction of the belts is described and pictured. Belt numbers, sizes and pitch lengths are given. A feature of the section is a suggested procedure for designing drives, using the Multi-V belts.

Hooker Electrochemical Co., Niagara Falls, N. Y.—A new wall chart, "Recommendations for Safety in Use and Handling of Liquid Chlorine Cylinders and Ton Containers," is



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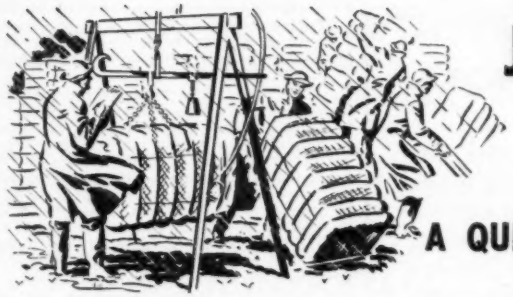

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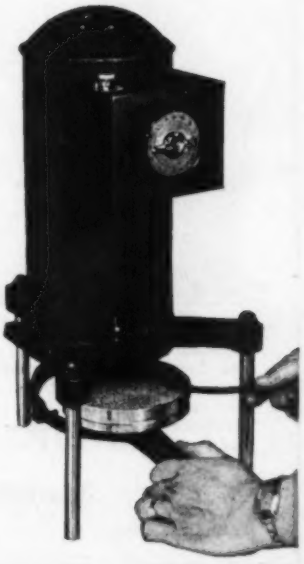

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International Nickel Co., 67 Wall St., New York 5, N. Y.—Available free from this company is the new booklet issued by its Corrosion Engineering Section. Complete in all engineering details, the bulletin includes drawings and other essential illustrative material. Brief but informative data for the production man and the engineer is given in its seven and a half pages. Ask for "Corrosion by Concentration Cells."

The Lincoln Electric Co., 12818 Coit Road, Cleveland 1, Ohio—A new bulletin issued by this company is its "Weldirectory for Hard Surfacing," No. 466. Typical applications are given for different requirements, many of which will be of interest to the paper and pulp manufacturer.

Lockport Felt Co., Newfane, N. Y.—Published by this company recently is a deluxe edition of the booklet, "Tenax Felt Serve the Paper Makers." A short history of the beginning of paper and the role of felts in paper manufacture is given, followed by an account of the service rendered by this company to the paper industry. A chapter is devoted to the process of felt manufacture at the Lockport Felt Mill, and another to the qualities of a good papermaker's felt. The booklet is illustrated with pictures of the manufacturing process.

Lyon-Raymond Corp., Greene, N. Y.—The use of hydraulic elevating tables for transporting and leveling strips and sheets to proper working height is described in new Bulletin 261. Included are actual installation photographs and complete specifications of the various models, which are offered in capacities from 2,000 lbs. and 10,000 lbs.

Oliver United Filters, Inc., 33 W. 42nd St., New York 18.—A new booklet which will be helpful to pulp and paper manufacturers is this company's Bulletin No. 251-R, "Laboratory and Pilot Plant Filters."

Reeves Pulley Co., Columbus, Ind.—Just released is a new, standard-size, 16-page booklet, "Reeves Automatic Production Control." Fully illustrated with photos and drawings, it discusses in detail the functions of the automatic production control and the means of applying it to production machinery. Included in the booklet are: hydraulic automatic control; mechanical automatic control; differential automatic control, also speed indicating mechanisms such as floating roll; follower roll; pressure regulator; diaphragm regulator; float regulator; bubble pipe regulator and others. Ask for Bulletin GN-487.

Roots-Connersville Blower Corp., 900 W. Mount St., Connersville, Ind.—A completely new booklet on "Rotary Positive Blowers," No. 22-23-B-13, is available upon request. The 20-page, two-color bulletin opens with an outline of the principal uses for blowers, followed by a discussion of operating advantages and principles, accompanied by performance curves. Complete views and cross-sections of each of the four standard types of blowers illustrate the description. Condensed specifications are also given. A double-page spread shows the construction of gears. Two pages are given to accessories, and five pages to applications for the blowers, including a figure showing a blower used for pneumatic conveying service in a paper mill.

Ross Heater & Mfg. Co., 1407 West Ave., Buffalo 13, N. Y.—Sent on request is a colorful new bulletin just issued by this company, containing illustrations and data on their complete line of re-designed "BCF" exchangers. The eight-page bulletin has cuatway views illustrating construction, and line drawings showing sizes, dimensions and weights. Ask for Bulletin 1.1K1.

The Thew Shovel Co., Lorain, O.—A new 16-page bulletin, "Self-Propelled Cranes," has been released by this company. It illustrates 48 of the various applications of self-propelled cranes for industrial material handling and construction operations. Among them is the loading of bales of paper.

United States Rubber Co., Mechanical Goods Div., Rockefeller Center, New York 20, N. Y.—Just published is a 100-page manual to assist engineers in designing both multiple and light duty V-belt drives. The manual includes a comprehensive set of drive tables for multiple belt; complete sheave data; complete fractional horsepower drive layout; and comparison tables with information on quarter turn drives and hexagon double V-drives. Also included is data on U. S. Royal super-service V-belts; U. S. Rainbow steel cord belts, and standard U. S. Rainbow V-belts with equa-tensil cord section.

Whiting Corporation, Harvey, Ill.—Just completed is an unusually descriptive, fully-illustrated series of catalogues on Whiting Trambeam Overhead Crane and Monorail Systems, which are the Whiting development of the overhead material handling systems taken over by Whiting when they purchased Spencer and Morris, Inc., Los Angeles, Calif. The innumerable applications for Trambeams are covered in descriptive booklets which describe general use, economy, fittings, carriers, electrification, assemblies, motor drives and cranes. Copies of Introductory Bulletin No. M-11, sent on request.

Worthington Pump and Machinery Corp., Harrison, N. J.—Two new bulletins are available from this company—No. W-350-B2E, "Antaciron Centrifugal Pumps, Type CU," for handling acids and acid slurries, describes a line of modern ball-bearing pumps. Sectional drawings and charts showing ratings illustrate the text. Photos and dimensional tables are also included. Bulletin W-305-B1A, is descriptive of "Centrifugal Pumps, Types CN-CNE," for belt, multi-drive and motor drive. Pages are devoted to specifications, installations, ratings and dimensions, with accompanying charts.

Books

The Chemical Technology of Dyeing and Printing—Authored by Louis Diserens, this book has been translated and revised from the second German edition by Paul Wengraf and Herman P. Baumann. It is principally intended for use by the chemist-colorist, in that, references are arranged in their proper dyestuff groups and the chemistry of the dyestuffs are explained in relation to their application to textiles.

The text of the book is arranged into five chapters. They are, consecutively, Vat Dyestuffs, Sulphur Dyestuffs, the Indigosols, the Insoluble Azo Dyestuffs, and Mordant Dyestuffs. Each chapter is undertaken thoroughly in up-to-date information and is discussed in all pertinent details. For example, in Chapter IV, a discussion is given to the series of arylides of oxynaphthoic acid, known as Naphthols AS, the basic invention leading to the production of fast bright yellows, oranges, reds, browns, bordeaux, and black, navy and violet.

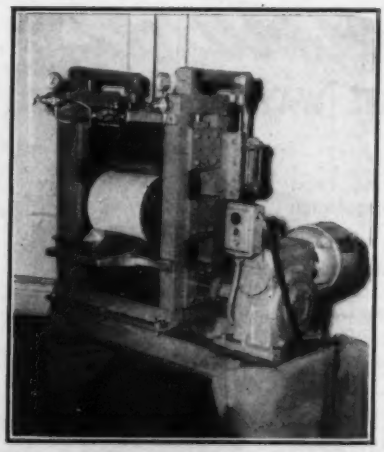
At the end of each chapter are complete tables of auxiliary agents pertaining to the chapter topic. They include the name of the agent, the manufacturer, the constitution, literature, and remarks. And in Chapter IV, there is a list of Coupling Components for Azo Dyestuffs, which give you the name, manufacturer, constitution, and the applications.

This book may be purchased from the Reinhold Publishing Corporation, 330 West 42nd Street, New York 18, N. Y., for the price of $11.00.

Paint and Varnish Technology—Edited by William von Fischer of Case Institute in Cleveland, this book contains contributions by thirty-three authors. It presents a complete survey of the chemistry, formulation, manufacture, and applications of paints, varnishes, lacquers and enamels. Sufficient chemistry is included to indicate the derivation of synthetic resin bases and the mechanism of the action of drying oils, driers, solvents, and other raw materials. Throughout the book the emphasis is on technological aspects, with much information on subjects such as exposure tests, viscosity, hiding power, film properies, special applications, and surface preparations. Numerous illustrations, charts, tables of data and bibliographic references are shown.

The price of this book is $8.00; it may be obtained from the Reinhold Publishing Corporation, 330 West 42nd Street, New York 18, N. Y.

Twenty Years of Experience...



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"Nekoosa-Edwards Paper Company has profited by its thirty-four years of membership in the National Safety Council. The service and assistance constantly available by the Council has materially aided in maintaining and carrying forward our safety program. This connection with the Council has greatly helped in lowering our accident frequency record.

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CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Blue Overalls	7.50 to 7.75
Corduroy, Men's	6.00 to 6.25
Corduroy, Ladies'	6.00 to 6.25
Washables, No. 1	4.50 to 4.75
Percales	6.50 to 6.75
Light Prints, No. 1	6.25 to 6.50
Khaki Cuttings—	
Bleachable	6.25 to 6.50
Unbleachable	5.50 to 5.75
New White Canvas	11.50 to 12.00
New Mixed Blacks	5.25 to 5.50
Canton Flannels, Bleached	10.75 to 11.00
Shirt Cuttings—	
New White No. 1	10.75 to 11.00
White Shrunk	10.00 to 10.25
Silesias No. 1	8.50 to 9.00
New Unbleached	11.00 to 11.25
Fancy	6.00 to 6.25
Linen Cuttings—	
American	8.00 to 8.50
White	14.50 to 15.50
Grey	13.50 to 14.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.25 to 1.30
No. 2	1.15 to 1.20
No. 3 and No. 4	.95 to 1.05
Twos and Blues—	
Repacked	3.00 to 3.25
Thirds and Blues—	
Repacked	2.85 to 3.00
Miscellaneous	2.25 to 2.50
Whites, No. 1—	
Repacked	4.75 to 5.00
Miscellaneous	4.00 to 4.25
White, No. 2—	
Repacked	3.50 to 3.75
Miscellaneous	2.75 to 3.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	8.50 to 9.00
Wool Tares—	
Light	8.00 to 8.50
Heavy	8.50 to 9.00
No. 1 Scrap Bagging	7.00 to 7.50
Manila Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.00 to 5.25
Sisal Rope—	
No. 1 large	5.50 to 5.75
No. 1 small	5.00 to 5.25
New Burlap Cuttings	8.50 to 9.00
Jute Threads—	
Foreign (Nom.)	6.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	5.00 to 5.25
No. 2 sisal	4.50 to 4.75
Soft jute	4.25 to 4.50
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	95.00 to 100.00
Hard White, No. 1	75.00 to 80.00
Soft White No. 1	60.00 to 65.00
Soft White, one-cut	85.00 to 90.00
Soft White, Misc.	55.00 to 60.00
Fly Leaf, No. 1	30.00 to 35.00
Fly Leaf, Woody, No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines	18.00 to 19.00
Mixed Books	13.00 to 14.00
Ledger Stock—	
No. 1 White	35.00 to 40.00
No. 1 Mixed (Colored)	25.00 to 30.00
Manilas—	
New Env. Cuttings	60.00 to 65.00
New Env. Cuts, One-Cut	—
Extra Manilas	—
Manila Tab Cards, Free of Ground Wood	60.00 to 65.00
Colored Manila Tab Cards	40.00 to 45.00
Kraft—	
New Envelope Cuttings	65.00 to 70.00
Tripled Sorted No. 1 100%	35.00 to 40.00
New 100% Cor. Cuts	35.00 to 40.00
No. 1 Old Assorted	25.00 to 27.50
News—	
White Blank	65.00 to 70.00
Overissue	17.00 to 18.00
No. 1 Baled	13.00 to 14.00
Old Corrugated Containers	14.00 to 15.00
New Jute Corrugated Cuts	20.00 to 21.00
Mill Wrappers	8.00 to 9.00
Box Board Chips	6.00 to 7.00
No. 1 Mixed Paper	6.00 to 7.00

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.05—
Ground, cwt.	3.80—
Powdered, cwt.	4.20—
Blanc Fixe—	
Pulp, bulk, ton	77.50—
Dry, barrels	85.00—
Bleaching Powder—	
Drums, cwt.	4.25 to 4.50
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	30.00 to 31.00
Argentine, lb.	27.00 to 28.00
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.40 to 2.70
Gelatine (silicin), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	.39½ to .40
Litharge, powd., bbl. lb.	.23 to .24
Rosin (Gum)—	
New York, per 100 lbs.	
E	8.45—
F	8.45—
G	8.45—
WW X	8.75—
Rosin (Wood), carlots	6.75—
Salt Cake—	
Dom. bulk (wks) ton	26.00 to 28.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	27.00 to —
Soda Ash—	
Bulk (works), cwt.	1.10 to 1.20
Paper Bags, cwt.	1.30 to 1.40
Barrels, cwt.	1.70 to 1.80
Soda (Caustic)—	
Solid drums, cwt.	3.05 to 3.10
Ground and flake, drums, cwt.	3.45 to 3.50
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works), cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	4.92—
Pearl, barrels, cwt.	4.92—
Paper, (Sp.) bags, cwt.	4.92—
Powdered, barrels, cwt.	5.03—
Sulphur (Crude)	
(Mine) bulk, long ton	18.00 to 18.00
Talc—	
Dom. 100 lb. bags (mine) ton	22.00 to 28.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig, bbls., lb.	.18 to .19½
Calcium Pig, bbls., lb.	.18 to .19½
Zinc Sulphide, bbls., lb.	11.50 to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances are:

Bleached sulphite, Swedish	165.00—
Bleached sulphite, Finnish	165.00—
Bleached sulphite, dom.	126.00 to 135.00
Easy bleaching sulphite	—
Unbleached sulphite, Swed.	140.00 to 143.00
Unbleached sulphite, Fin.	140.00 to 143.00
Unbleached sulphite, dom.	118.00 to 130.00
Unbleached kraft, Swedish	127.50—
Unbleached kraft, Finn.	127.50—
Unbleached kraft, northern	115.00 to 125.00
Unbleached kraft, southern	105.00 to 120.00
Bleached sulphate, Swedish	150.00 to 165.00
Bleached soda, domestic	130.00 to 135.00
Sulphite screenings, dom.	40.00 to 50.00
Sulphate screenings, dom.	40.00 to 50.00
Groundwood, domestic and Canadian	80.00 to 85.00

PAPER

f.o.b. New York City

Boards—	per ton
Binders	94.00—
Chip	80.00—
Chip, tube and can	85.00—
Chip, full blending	87.50—
Chip, sgl. mla. lined	85.00—
Coated, white patent .016	120.00—
.020 and heavier	110.00—
Kraft liner	79.00—
Filled News	82.50—
Container	90.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ten lots)

Uncoated (Untrimmed)

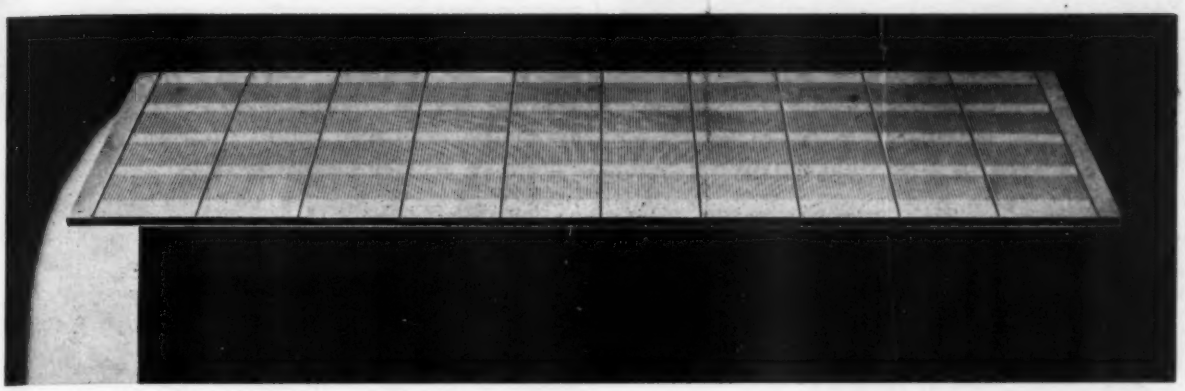
Book, White (M. F.)—	
A Grade E. F.	14.85—
B Grade E. F.	14.85—
A Grade S. C.	15.35—
B Grade S. C.	14.95—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White (Trimmed 4 sides)	
No. 1 Glossy	20.15—
No. 2 Glossy	18.90—
No. 3 Glossy	18.25—
No. 4 Glossy	—
No. 2 Offset	14.60—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—	per cwt.
(In Ten Lots)	
Extra 100% Rag	52.30—
100% Rag	48.30—
75% Rag	36.70—
50% Rag	29.50—
25% Rag	20.25—
Rag Content Ledger—	per cwt.
(In Ten Lots)	
Extra 100% Rag	50.50—
100% Rag	44.50—
75% Rag	36.70—
50% Rag	29.50—
25% Rag	20.25—
Sulphite Bond—	per cwt.
Air dry, watermarked	—
No. 1 watermarked	18.50—
No. 2 watermarked	17.55—
No. 4 watermarked	16.85—
Sulphite Ledger—	per cwt. Zone 1
No. 1 watermarked	18.85—.
No. 2 watermarked	18.05—
No. 4 watermarked	17.35—
Glassine (f.o.b. mill)—	per cwt
Embossed (25 lbs. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof— Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
News—	per ton
Rolls, Standard (Contract)	100.00 to 103.00
Rolls (Spot)	(Nominal)
Sheets	119.00—
Tissues (Carlots)—	per ream
White No. 1	1.85—
White No. 2	1.75—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.85—
Manila	1.80—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.80—
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M. shts.) per cs.	8.75 to 10.00
Toilet, Unbleached (M. shts.) per cs.	7.50 to 10.00
Towels—	per case
Bleached	4.75—
Unbleached	4.00—
Wrappings (Kraft)—	per cwt
Super-Standard	9.00 to—
No. 1 Wrapping	7.50 to 8.00
Standard Wrapping	7.00 to 7.25
Standard Bag	6.50 to 7.00
Variety Bag	—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)

Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only (10,000 lbs.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers—	
Com. Gr. Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	—
Envp. Mla., Sub. 16-28 (No. 2)	—
Envp. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B26 lb.	—
Grade A-23 lb.	—



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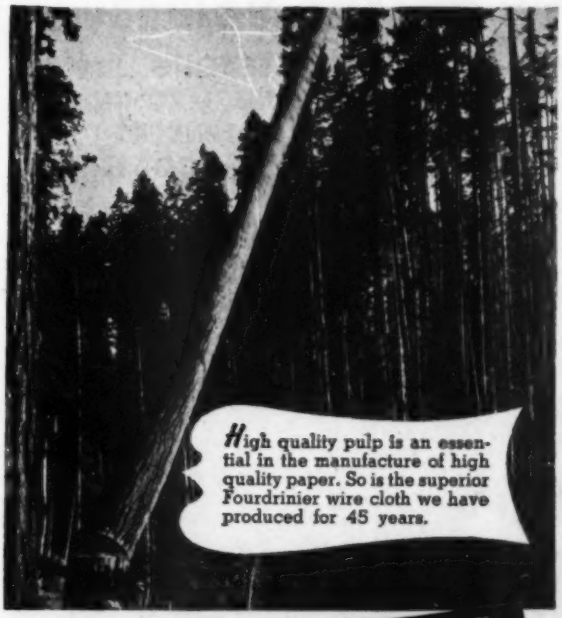
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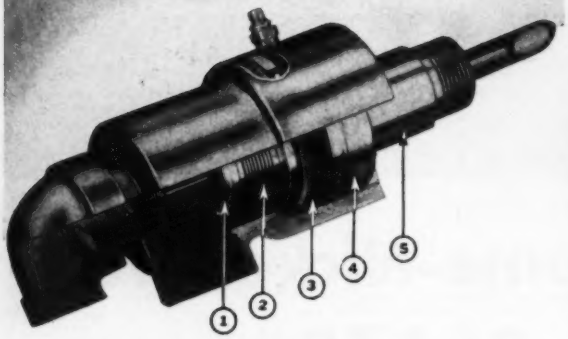

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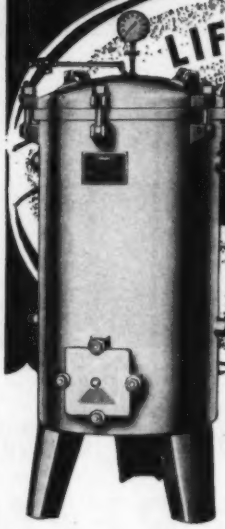

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• *The 1948-49*

PAPER AND PULP MILL CATALOGUE

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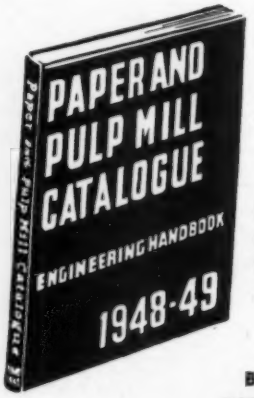

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Pertinent tables, charts and other authoritative data relative to the proper operation and maintenance of pulp and paper mills.

BIGGER—BETTER CATALOGUE SECTION

Prominent manufacturers of pulp and paper mill equipment and supplies present in these descriptive pages important information about their products.

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Complete cross-indexed buyer's service listing sources of purchase of machinery, equipment, chemicals and supplies and other important information.

Firms listed in the margin of this page describe their products in the 1948-49 edition.

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American Defibrator, Inc.
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Link-Belt Company

Mason-Neilan Regulator Co.
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Michigan Pipe Company
Monsanto Chemical Company
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Sandy Hill Iron & Brass Works, The
Seybold Division, Harris-Seybold Company
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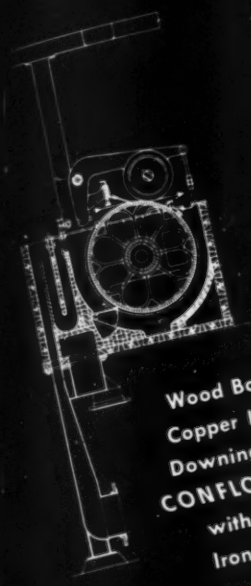
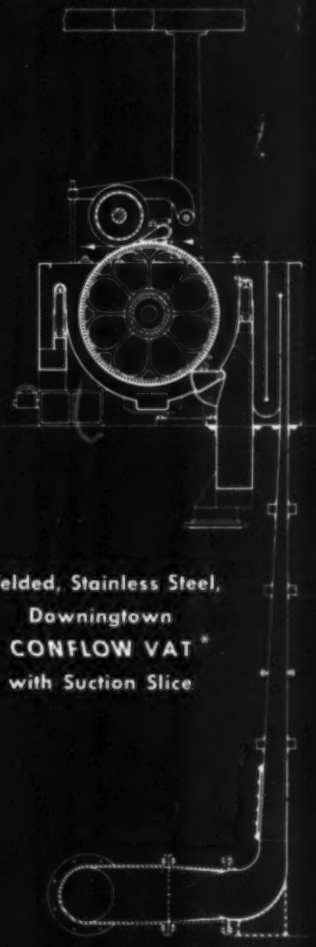
*PROFLOW** and CONFLOW* Vats

New Names for Established Principles

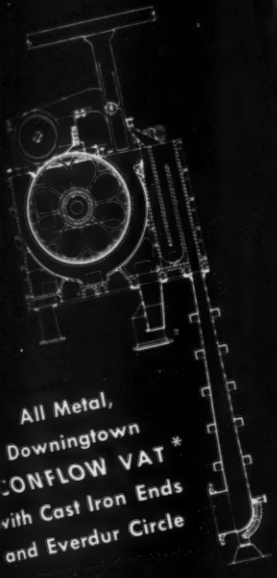


Wood Body, Copper Lined Downingtown CONFLOW VAT* with Cast Iron Ends

Welded, Stainless Steel, Downingtown *PROFLOW* VAT*



Welded, Stainless Steel, Downingtown CONFLOW VAT* with Suction Slice



All Metal, Downingtown CONFLOW VAT* with Cast Iron Ends and Everdur Circle

Fundamentally, there are just two types of board machine vats, one, in which the direction of stock flow is "with" the rotation of the cylinder mould, and the other, in which the direction of stock flow is "against" the rotation of the mould. Both types have been used for years, but the modern, improved Downingtown Designs in both types are different, so to identify them in the industry, we are naming them as follows: *PROFLOW* VATS* in which the direction of stock flow is "with" and CONFLOW VATS* in which stock flow is "against" the rotation of the cylinder moulds. Both types and all designs of Downingtown Vats assure continuous production of a well formed sheet of uniform weight and caliper. Write us.

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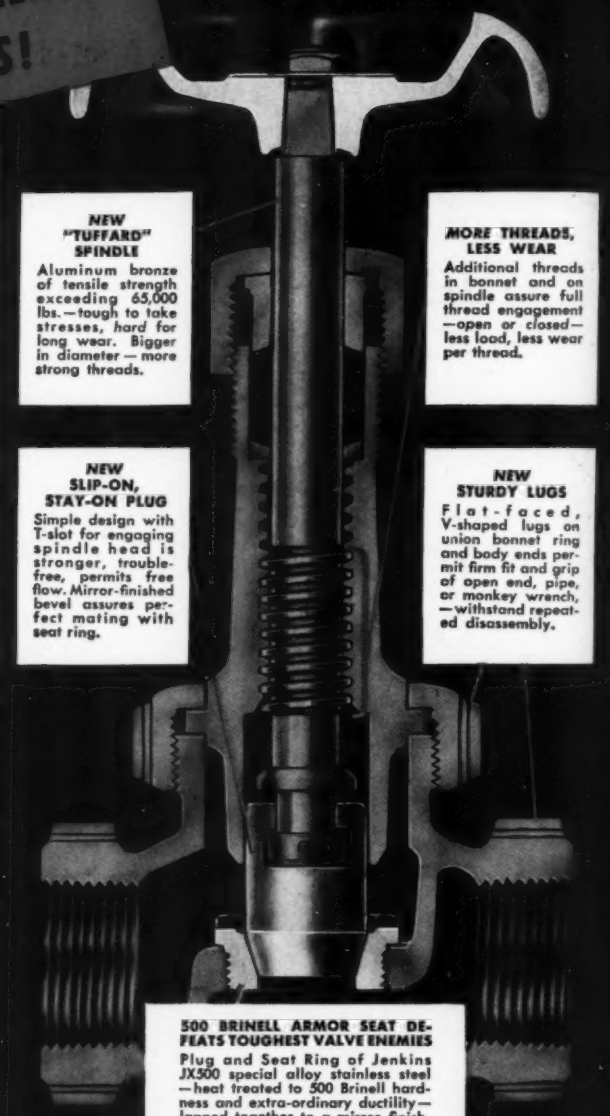
JENKINS ANSWER TO VALVE-KILLING SERVICES!

JENKINS Fig. 976-A

PLUG TYPE

Armor Seat

BRONZE GLOBE VALVE



NEW "TUFFARD" SPINDLE

Aluminum bronze of tensile strength exceeding 65,000 lbs.—tough to take stresses, *hard* for long wear. Bigger in diameter—more strong threads.

MORE THREADS, LESS WEAR

Additional threads in bonnet and on spindle assure full thread engagement—open or closed—less load, less wear per thread.

NEW SLIP-ON, STAY-ON PLUG

Simple design with T-slot for engaging spindle head is stronger, trouble-free, permits free flow. Mirror-finished bevel assures perfect mating with seat ring.

NEW STURDY LUGS

Flat-faced, V-shaped lugs on union bonnet ring and body ends permit firm fit and grip of open end, pipe, or monkey wrench,—withstand repeated disassembly.

500 BRINELL ARMOR SEAT DEFEATS TOUGHEST VALVE ENEMIES

Plug and Seat Ring of Jenkins JX500 special alloy stainless steel—heat treated to 500 Brinell hardness and extra-ordinary ductility—lapped together to a mirror finish. Unaffected by throttled steam, resists galling, erosion, corrosion.

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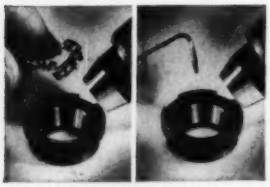
Now, for the most severe services, you can choose the new Jenkins Fig. 976-A with complete confidence that it will set new economy records. Use it for pressure regulation, bleeds, drips, and drains, or any close regulation of steam that threatens wire drawing. It will lower maintenance, last longer, where entrapped pipe chips, scale, or rust tubercles are a problem.



SMASHED PIPE CHIPS, WIRE, LEAVE NO SCARS

Steel pipe chips and 1/16" wire rod, with Brinell hardness in excess of 300, were crushed between the new Jenkins JX500 Plug and Seat Ring without leaving a scratch or dent. That's proof of super hardness!

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